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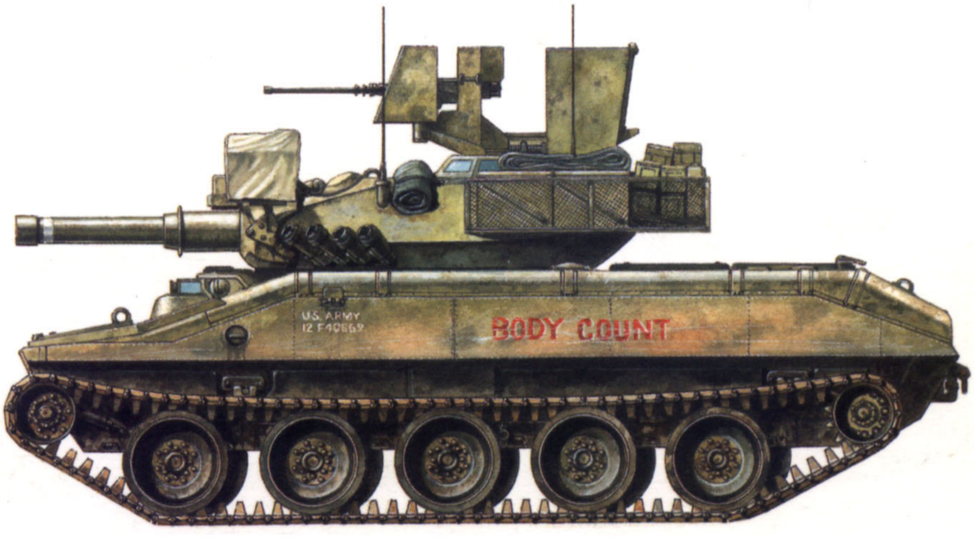
ARMOR AT WAR SERIES

7007

ARMOR OF THE VIETNAM WAR

(1) ALLIED FORCES

Michael Green & Peter Sarson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CONCORD
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ARMOR OF THE
VIETNAM WAR

Text by Michael Green
Color plates by Peter Sarson

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Introduction

BACKGROUND

In the early days of U.S. involvement in South Vietnam (prior to the 1965 buildup), it was generally believed by America's military leaders that the only ground units suitable to fight in that country were light infantry units. This belief was largely shaped by the terrain and weather of Vietnam.

The former country of South Vietnam could be broadly divided into three distinct topographic regions. The first being the 18,600 square mile Central Highlands region which consisted of everything from 7,000 feet mountain peaks down to gently rolling volcanic plateaus with elevations between 2,600 and 5,000 feet.

The second region of South Vietnam consisted of the Coastal Lowlands which is a narrow belt of plains extending from the Mekong Delta area all the way up the country's coast into North Vietnam. The region, enclosed on the landward side by the Central Highlands, is never more than 40 miles wide. The entire coastal strip is segmented by mountain spurs that extend to the sea. The region is in varying degrees of cultivation and is interspersed throughout with sand dunes.

The third region of South Vietnam was referred to as the Southern Plains and took in the intermediate lowlands and the Mekong Delta. Elevations in this area ranged from 300 feet in the northern lowlands sector down to near sea level near the delta. The intermediate lowlands was largely covered by dense rain forests with a few small crop growing areas and rubber plantations. The Mekong Delta is the most fertile plain in Vietnam and is its largest rice-producing area. Almost the entire delta is covered with rice fields situated within an interlacing network of rivers, streams, and irrigation canals.

Vietnam has a tropical monsoon-type climate which is characterized by warm, wet summers and mild, dry winters. During the summer months Vietnam receives an average rainfall of between 55 to 110 inches in the north of the country and 40 to 95 inches in the south.

The road system of South Vietnam consisted of 15,000 miles of roadways, only two thirds of which were paved. The remainder, for the most part, ranged from poor to fair condition.

What roads that did exist in South Vietnam in the early 1960s were extremely narrow, unsuitable for anything heavier or larger than a small truck or bus. In addition, the South Vietnamese road system was plagued by numerous ferry crossings, fords, sharp curves, steep grades, and low bridge clearances. The highway bridges that did exist, consisted mainly of temporary wooden structures that could accommodate only the lightest of wheeled vehicles.

THE BUILD UP BEGINS

Despite the French military failure in Vietnam (the last French soldier left Vietnam in 1956), in the mid-1960s, America's political and military leader began pouring men and material into South Vietnam in a futile effort to prevent the fall of the morally bankrupt and corrupt puppet governments of that country. As America increased its military presence in South Vietnam the nature of the enemy threat also changed from small local Viet Cong (VC) guerrilla units to well-trained and equipped light North Vietnamese Army (NVA) regiments and divisions. While these forces still depended on the ambush and other guerrilla tactics to a great extent they also used more antipersonnel mines, more modern small arms, and possessed greatly increased antitank capability.

At regimental level, the VC and the NVA units were equipped with 75mm recoilless rifles. At close range, the 75mm recoilless rifle could penetrate the armor of any American armored vehicle. More common than the 75mm recoilless rifles among VC and NVA units was the 57mm recoilless rifle. The ability of this weapon to kill American armored vehicles was somewhat limited. A kill required a direct hit either in a fuel cell or the detonation of the vehicle's basic load.

The VC and NVA also used Soviet-built rocket propelled antitank grenade-launchers (RPGs) in large numbers. While these types of weapons needed to be employed at extremely close ranges to be effective, the VC and NVA never lacked for soldiers willing to die in an attempt to destroy American armored vehicles.

By far, the most effective and widely used weapon employed against American armored vehicles in the Vietnam War was the mine. They were often command detonated and typically ranged from 10 pounds up to 100 pounds. Mines would be a constant and persistent problem for not just American armored vehicles but the South Vietnamese Army (ARVN) as well as other Allied units stationed in South Vietnam. Although many measures were devised to defeat enemy mines, no adequate means were ever found.

In response to the evolving nature of the enemy threat in South Vietnam, an ever deepening spiral of military escalation was begun by the government of the United States. It was soon decided that sending large numbers of armored fighting vehicles to South Vietnam would provide a tactical advantage over the VC and NVA that would turn the tide of the conflict in America's favor. Unfortunately, like so many other short-term advantages provided by America's lead in military hardware and technology, they were impossible to sustain in the long-term. Because the North Vietnamese government and its supporters in South Vietnam were determined to win at any cost, no matter how long it took, the deployment of America's armored might during the Vietnam War and any successes it enjoyed meant very little in the big picture view of a war that should have never been fought to begin with. It was a war that the majority of Americans felt was fundamentally wrong and immoral. Even Robert McNamara, the then Secretary of Defense during the Vietnam War, now admits that "we were wrong, terribly wrong."

MISSIONS AND TACTICS

American armor units which arrived early in the Vietnam War had to literally invent tactics and techniques to deal with the enemy threat. The ground war in South Vietnam was nothing like the large conventional wars that American tankers had fought in past. The VC and NVA were not contained by a line of friendly forces. Instead, the VC and NVA operated throughout the country, mostly in small units, but massed their forces when and where he chose. Accordingly, American, ARVN, and Allied units ground operations were characterized by numerous, concurrent, widely dispersed small-unit operations.

Typical missions assigned to American armor units in South Vietnam consisted of search and destroy, clear and hold, and security.

Search and destroy operations were designed to locate enemy installations, destroy VC and NVA forces, and destroy or evacuate supplies and equipment. Less importance was attached to seizing critical terrain than to finding and finishing the enemy armed forces. The enemy forces were to be attacked by a combination of maneuvering and blocking elements, both supported by artillery and air elements.

When a significant enemy force was found, American armor forces in South Vietnam tended to have their tanks leading the attack. This was the complete opposite of then accepted American military doctrine. This change in doctrine was forced on American armored units because tanks were needed in jungle and heavily overgrown areas to break pathways for the infantry, set off antipersonnel mines, and support the infantry by fire against strong points, crew-served weapons, etc.

Clear and hold operations were aimed at driving the enemy forces out of a designated area and keeping them out. Battle experience in South Vietnam showed that combat ranges for American armored vehicles were generally under 300 meters; however, engagements at under 15 to 25 meters were not uncommon, especially in areas of dense vegetation. Enemy targets tending to be very hard to spot in such environments. The basic load for tanks in such terrain usually consisted of High Explosive (HE), canister or beehive rounds, and smoke. Beehive shells were the most commonly used round.

Security operations for armor units included convoy, route, base, and area security. Convoy security operations were accomplished by temporarily securing a route to be used or by accompanying a convoy with an appropriate escort. In some instances, a combination of both methods proved appropriate, with a portion of the unit securing the route and providing a reaction force and another portion moving with the convoy.

Those few American armored formations in South Vietnam in 1966 and early 1967 achieved some significant success in combat. The 11th Armored Cavalry Regiment and other units had proved that mounted formations could conduct combat operations more easily and more effectively than dismounted formations.

COMBAT ACTION

An example of the effective use of armored vehicles against the VC can be found in extract from an official U.S Army report which describes an incident in March 1967 when an American Army Fire Support Base was attacked by a large enemy force. An armored column was sent to relieve the besieged defenders. The extract begins: "On the smoke-covered battlefield the reinforced defenders were still in desperate straits. Artillery men were firing beehive rounds, steel flechettes [beehive rounds] released at the muzzle of the weapon. When the supply of beehive was exhausted, they switched to high-explosive direct fire at point-blank ranges. The eastern sector of the perimeter had fallen back under heavy pressure to position around the artillery pieces. The Viet Cong were within five meters of the battalion aid station and within hand grenade range of the command post."

"Into this chaos came the tanks and APCs, crashing through the last few trees into the clearing. The noise was overwhelming as the new arrivals opened up with more than 200 machine guns and 90mm tank guns. The ground shook as tracked vehicles moved around the perimeter throwing up a wall of fire to the outside flank. They cut through the advancing Viet Cong, crushing many of them under the tracks. The Viet Cong, realizing that they could not outrun the encircling vehicles, charged them and attempted to climb aboard but were quickly cut down. Even the tank recovery vehicle of Company A, 2nd Battalion, 34th Armor, smashed through the trees with its machine gun chattering. Most of the crew, who were all mechanics, were throwing grenades, but one calm mechanic sat serenely atop the vehicle, his movie camera grinding away....With victory almost within grasp of the enemy, the tanks and APCs had turned the tide. When the smoke cleared, it was apparent that the enemy had not only been defeated but had lost more then 600 men."

Despite the general success enjoyed by American armored fighting vehicles in South Vietnam in 1966 and 1967, the VC and NVA units could still inflict losses on American military units when conditions were right. An example of this occurred in December, 1967 when two platoons of the 11th Armored Cavalry Regiment were tasked with protecting a truck convoy. An extract from an official U.S. Army report describes what happened when the American armored unit drove into a well-planned Viet Cong ambush: "As the lead tank started up the southernmost rise at 0410, the last vehicle in the convoy, the mortar convoy, was leveling off on the straight stretch two kilometers behind. Suddenly a rocket propelled grenade round hit the lead tank, killing the driver and stopping the tank in the middle of the road. An ambush then erupted along the entire two-kilometer stretch of road. A hail of grenades quickly set the remaining vehicles of the lead platoon afire; intense small arms fire killed most of the men riding atop of the vehicles. As the trailing platoon leader directed his platoon into a herringbone formation, the mortar carrier was hit by a command detonated mine, exploding mortar ammunition destroyed the carrier. The tank with the last platoon was hit by a rocket grenade round, ran off the road, blew up, and burned. The surprise was so complete that no organized fire was returned. When individual vehicles attempted to return fire, the enemy, from positions in a deadfall some fifteen meters off the road, concentrated on that one vehicle until it stopped firing. Within ten minutes the fight was over." Of the eleven armored vehicles belonging to the 11th Armored Cavalry Regiment that got caught in the VC ambush, four M113s and one M48 tank were destroyed with another three M113s and one other M48 tank severely damaged. The two American Army platoons suffered 42 casualties. Apparently none of the VC were killed or wounded.

Not all VC or NVA ambushes turned out this well for the enemy. On December 2, 1966 a convoy escorted by units of the 11th Armored Cavalry Regiment drove into a well-planned VC ambush. The following extracts from an official U.S. Army report describes what happened: "As the convoy passed through Suoi Cat, the men in the column noticed an absence of children and an unusual stillness. Sensing danger, Lt. Radosevich was turning in the tank commander's hatch to observe closely both sides of the road when he accidentally tripped the turret control handle. The turret move suddenly to the right, evidently scaring the enemy into prematurely firing a command detonated mine approximately ten meters in front of the tank. Lt. Radosevich immediately shouted 'Ambush! Ambush! Claymore Corner!' over the troop frequency and led his convoy in a charge through what had become a hail of enemy fire while he blasted both sides of the road....By the time Troop B had traversed the entire ambush area, turned around, and was making a second trip back towards the east, Company D and Troop C followed close behind, raking both sides of the road with fire as they moved. The tanks fired 90mm canister, mowing down the charging Viet Cong and destroying a 57mm recoilless rifle....Troop A, now to the west of the ambush, entered the area, surprising a scavenging party, and killed fifteen Viet Cong."

"As the Troops A and B and company D consolidated at the ambush site, enemy fire became intense around Troop B. The Viet Cong forces were soon caught in a deadly crossfire when the cavalry units converged. As darkness approached, the American troops prepared night defensive positions and artillery fire was shifted to the south to seal off enemy escape routes. A search of the battlefield the next morning revealed over 100 enemy dead. The toll, however, was heavier than that. Enemy documents captured in May 1967 recorded the loss of three Viet Cong battalion commanders and four company commanders in the Suoi Cat action."

During the massive Tet offensive, which started in early 1968, as well as follow-up VC and NVA offensives conducted in May 1968 and August 1968, American and ARVN armored units would play a significant and vital role in denying the enemy any of its objectives. The ability of armored units to move fast with overwhelming firepower had been of the utmost importance throughout the enemy offensives. In a period of seven months, the VC and NVA combined lost over 60,000 dead with untold number wounded. It wouldn't be until March 1972, when the last American armor unit had left South Vietnam, that the NVA and VC would dare to launch another major offensive against South Vietnam.

THE M113 IN VIETNAM

Of the many different types of armored fighting vehicles that were used during the conflict, the one vehicle that has come to most symbolize American involvement in the Vietnam War was the well-known M113 armored personnel carrier (APC). First developed in 1960 to replace the steel-hulled M59 armored infantry vehicle, the M113 became the first aluminum armored vehicle to be built in large numbers.

Because of aluminum armor's lighter weight compared to steel armored vehicles, it became feasible to build an air-droppable and air-transportable personnel vehicle that carried a squad (10 men) in armored protection. In addition to the air-transportable advantages, the vehicle was amphibious, which permitted the carrier to cross inland waterways.

When the U.S. Army first ordered the M113, it was envisioned that the vehicle would primarily be used as an armored division infantry squad carrying vehicle capable of keeping up with armored columns of M48 and M60 main battle tanks, something its earlier cousin, the M59, was not able to do well.

As most of the U.S. Army's fleet of tanks were stationed in Western Europe at the time, the designers of the M113 might not have foreseen its widespread use in Southeast Asia. Due to the design of the M113 being basically sound and reliable, the vehicle was easily adapted into its new-found role during the Vietnam War as a combat vehicle.

The first M113s to reach South Vietnam were in early 1962. Originally designated to be sent to U.S. Army units in West Germany, 32 M113s were used to outfit two mechanized companies of the Army of the Republic of Vietnam (ARVN), who were fighting VC units in the Mekong Delta area of South Vietnam. The ARVN units quickly took to the vehicles and started to use them as infantry combat vehicles, not as the armored taxis that their American advisors had been taught to use them as. In the following years, as American Army units deployed to South Vietnam, they quickly adopted the ARVN tactics with their own M113-equipped units.

As experience was gained with the use of the M113 in combat, numerous modifications were made to the vehicle to increase both its firepower and crew protection features. No longer would the M113 be a simple battlefield taxi. Instead, it would eventually become a fighting vehicle in its own right, commonly referred to as the Armored Cavalry Assault Vehicle (ACAV).

COMBAT ACTION

An extract from an official U.S. Army report gives a description of such vehicles: "The crews of the ACAVs numbered four instead of the authorized five...The six riding infantry, in T-shirts and jungle hats and beads, carried light packs, three hundred rounds of ammunition, ten hand grenades, four smokes, and their rifles, with incense in their cargo pockets, lounged against the rear gunshields. On the floor of the ACAV (the seats had been knocked out with a sledge on receipt) was a double layer of sandbags, two sheets of heavy plywood, and a double layer of ammunition (sixteen thousand rounds) in cans for the machine guns. The engine was inaccessible. There were one hundred hand grenades hanging by the spoon on wooden cabinets the crew had installed, a dozen bangalores, and various shaped charges and explosives. There were also two extra machine guns, 'combat losses' earlier. All of this was felt to be necessary to survive for two hours after first contact—there was never any resupply, and the guns were coming apart. Up front on the ACAV, the splash board, with a spare road wheel bolted on, was leaned forward and secured with rope scrapped from the Navy, to allow cots, mattresses, water, ice in cans, soda, beer, and rations to be stored against the engine access hatch. The engine and transmission could not be maintained. All over the ACAV, identification was painted black—it made it difficult for the natives to identify the unit when tolls were charged for crossing bridges. There was always charcoal for barbecues, and ice. On the splash board was painted, in black in six-inch letters, 'KILL FOR PEACE.' Beneath the slogan, on the rope, hung four long black hair falls—the native women had a superstition about never cutting their hair."

ARVN ARMORED VEHICLES

South Vietnamese armor units were equipped with a mixture of obsolete World War II vehicles prior to American involvement in the early 1960s. As the American military commitment to the support of the South Vietnamese government grew in scope, the ARVN were provided with a selection of armored vehicles out of the U.S. Army inventory. First to arrive in the country were a small number of M113 armored personnel carriers in 1962. Eventually, the M113 would become the backbone of the Vietnamese armor, constituting some seventy five percent of their units.

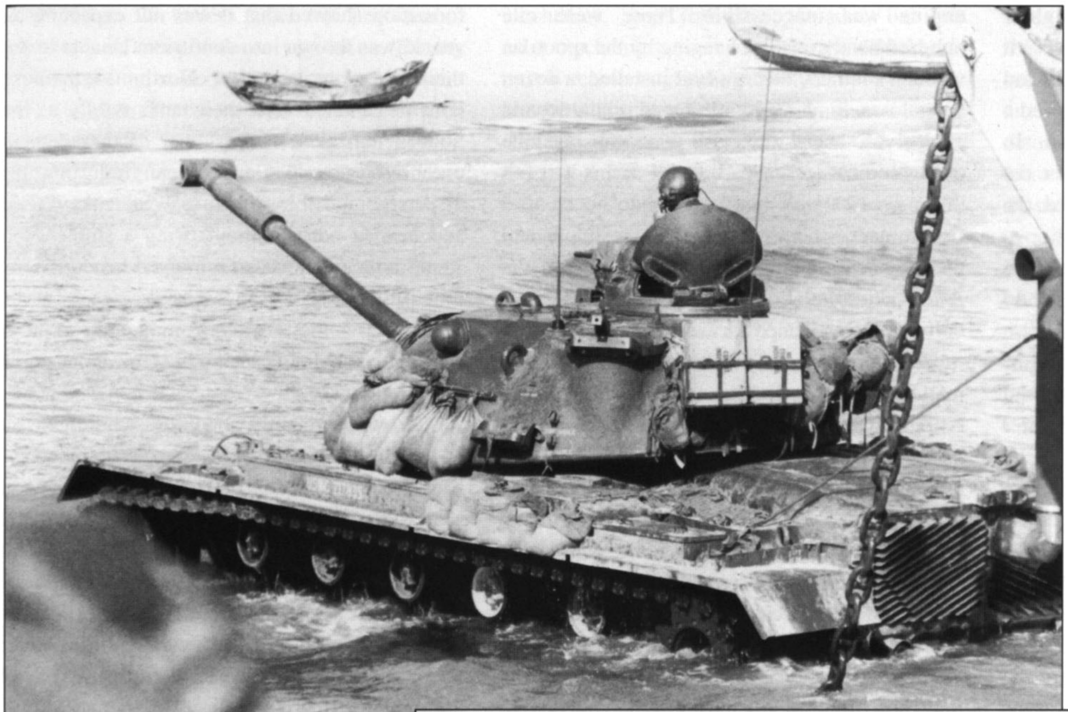
In 1965 the ARVN were supplied with a number of M41A3 light tanks to replace their aging World War II era M24 light tanks. It wasn't until 1971, with the American military pull-out in high-gear, that the ARVN were supplied with 54 worn-out M48A3 tanks. After a difficult transition period ARVN tanker made effective use of their Patton tanks. An example of this can be found in extracts from an official U.S. Army report describing the defensive struggles of the ARVN 20th Tank Regiment in April 1972: "About noon men of the 1st Squadron, from their vantage point on the high ground to the west, suddenly observed a North Vietnamese tank and infantry column moving south along Highway 1 towards Dong Ha. Moving their tanks into concealed positions, they waited as the enemy tanks moved closer. At a range of 2,500 to 3,000 meters, the South Vietnamese tankers opened fire, quickly destroying nine PT-76 tanks and two T-54 tanks. The North Vietnamese unit, which by its column formation showed that it was not expecting an attack, was thrown into confusion. Unable to see their adversaries, the North Vietnamese crewmen maneuvered their tanks wildly as the South Vietnamese tank gunner destroyed them one by one. The accompanying infantry dispersed, and the surviving T-54 tanks turned and headed north without firing a single shot. The South Vietnamese regimental headquarters, monitoring the North Vietnamese radio net at the time, heard the enemy commander express surprised disbelief at losing his tanks to cannons he could not see."

While these tanks and crews would give an excellent account of themselves in helping turn back the massive NVA offensive which began on March 30, 1972, their efforts as well as many other brave South Vietnamese soldiers would only temporary delay the inevitable collapse of the South Vietnamese Government and its military which began in December 1974 under the weight of a massive NVA offensive led by combined arms formation of enemy tanks operating in conjunction with infantry, artillery, and air support. On April 30, 1975 NVA tanks entered the city of Saigon, the capital of South Vietnam and ended a war which had cost the lives of almost 58,000 American soldiers, 1.1 million North Vietnamese and Viet Cong soldiers, and two million civilians.

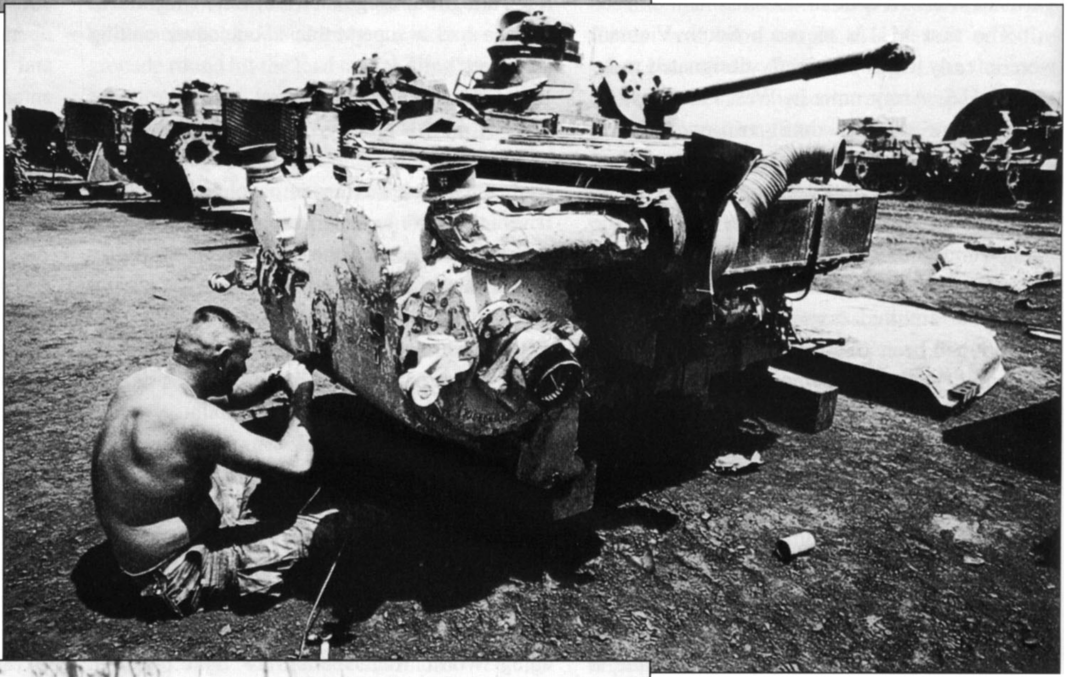
This book is not the definitive history of armor in the Vietnam War, but will only attempt to portray in photos a quick look at some of the various types of armored vehicles employed in Vietnam by the U.S. Army, the U.S. Marine Corps, plus the ARVN and various Allied Forces.

Special thanks for help in providing photos and background material for this book are due to Armor Magazine, Dick Hunnicutt, Chuck Porter, the National Archives, the Patton Museum of Cavalry and Armor, Chris Foss, Jimmy Carter and the marketing dept. staff of FMC, Jim Loop, Dean and Nancy Kleffman, Jim Mesko, and Greg and Randy Steward.

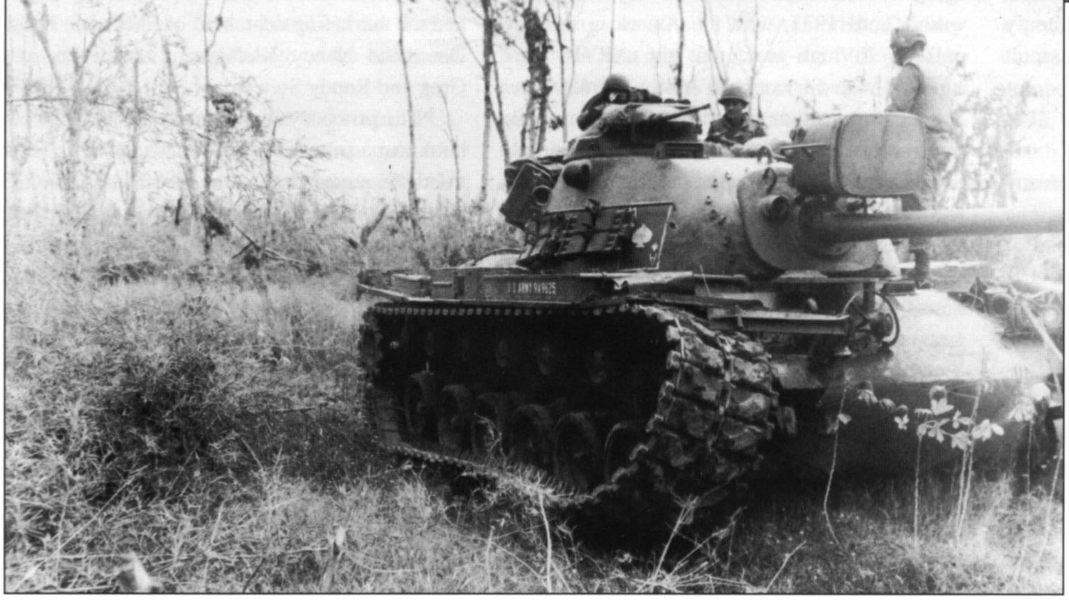
The primarily source material for this photo book came from General Donn A. Starry's book titled "Mounted Combat In Vietnam." published by the Department of the U.S. Army. The book was first released by the Superintendent of Documents, U.S. Government Printing Office in 1978. The book is now out of print and is no longer available from the Government Printing Office. Some copies can be found with military used book dealers.



The most numerous tank used by the United States Army and Marine Corps units during the Vietnam War was the M48A3 tank (nicknamed the Patton), first entering the United States military inventory in 1963. The M48A3 was not a brand-new vehicle, but, merely a cost-effective way of upgrading the U.S. Army's and Marine Corps fleet of older and then obsolete M48A1 tanks. Pictured coming off a naval landing craft on September 7, 1965 is this Marine Corps M48A3 tank fitted with a deep water fording exhaust stack attached to the rear of the vehicle.

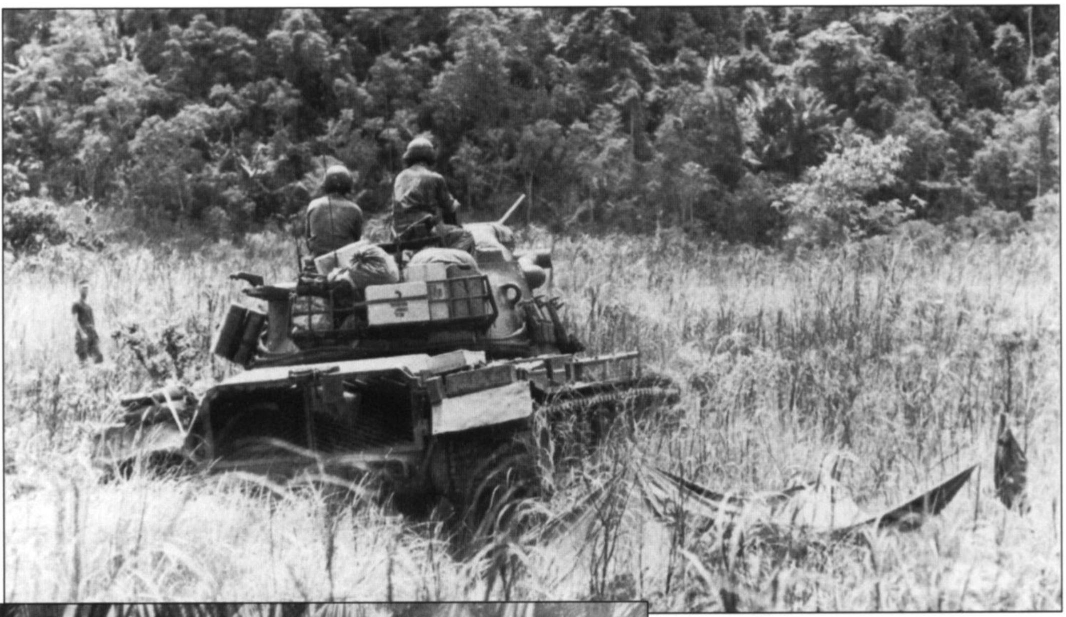


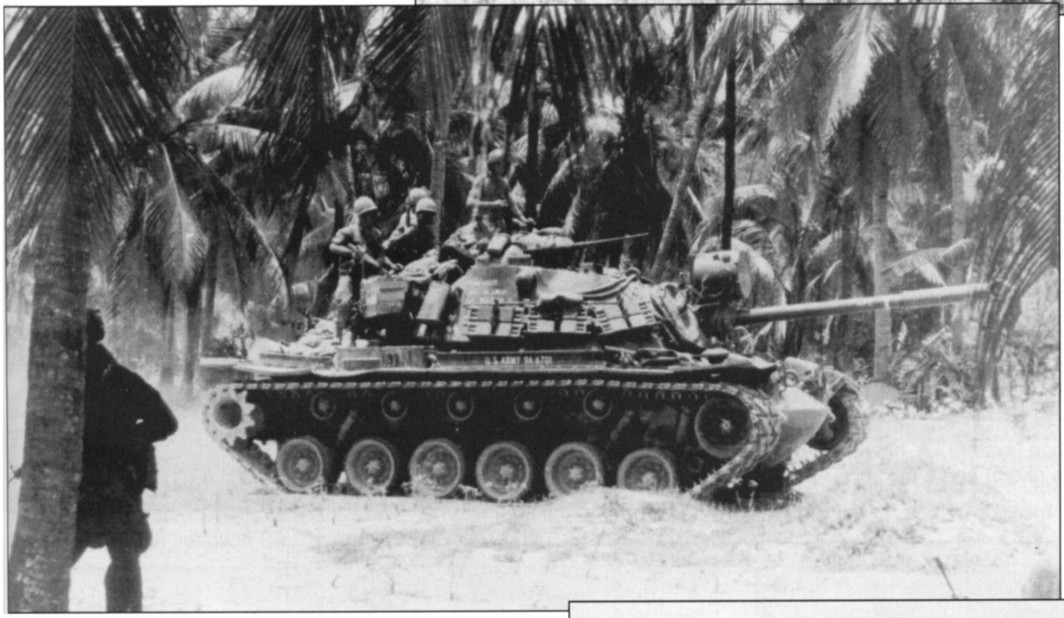
The M48A3 Patton tank was one of a series of modifications to the basic M48 tank, first produced in 1953. While the initial production model of the M48 series (which included the M48, M48A1, M48A2, and M48A2C variants) were powered by large gasoline engines, the M48A3 was upgraded with a Continental AVDS-1790-2A, 12 cylinder, air-cooled diesel engine and CD-850-6A2 transmission that could produce 750bhp at 2,400rpms. Pictured in South Vietnam is a tank mechanic working on the power pack of an M48A3 tank. The large white-painted object in the foreground is the vehicle's transmission. With a top speed of 30mph the M48A3 had a maximum range of 300 miles on a full load of fuel. Other improvements incorporated into the M48A3 tanks included improved driver's controls and a new fuel and electrical system.



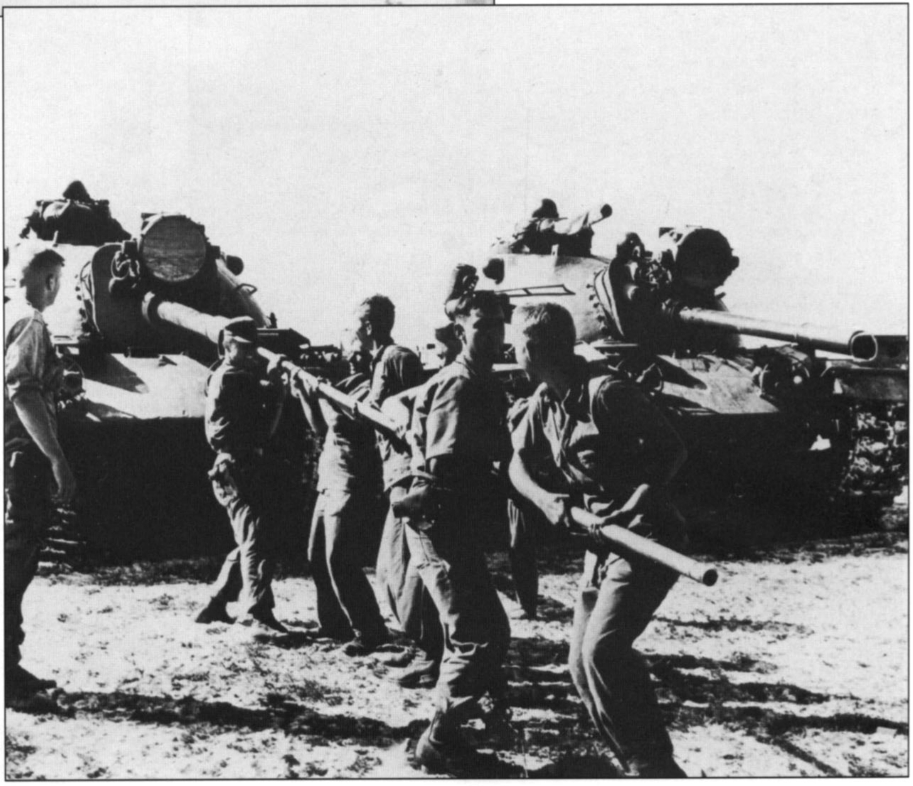
With the conversion of M48A1 tanks into the upgraded M48A3 model the U.S. military decided to use as many M60 tank components as possible. These would include the replacement of the interior oil bath air cleaners as found on the M48A1 tank with M60 type fender mounted dry units. M60 type personnel heaters were also installed with their exhaust pipes extending out the right side of the hull of the M48A3 tank. Pictured is an M48A3 tank from C Company, 2nd Battalion, 34th Armor which had shed one of its tracks after hitting a mine during "Operation Cedar Falls" on January 17, 1967.

This picture shows the rear of a Marine Corps M48A3 tank near Dong Ha in 1966. Clearly visible is the vehicle's stowage basket which was normally used to store the crew's personal gear such as sleeping bags and rations. Also visible is the deep water exhaust device mounted on the rear engine exhaust door. The stack normally attached to this device has been removed from this vehicle and is not visible in this picture.

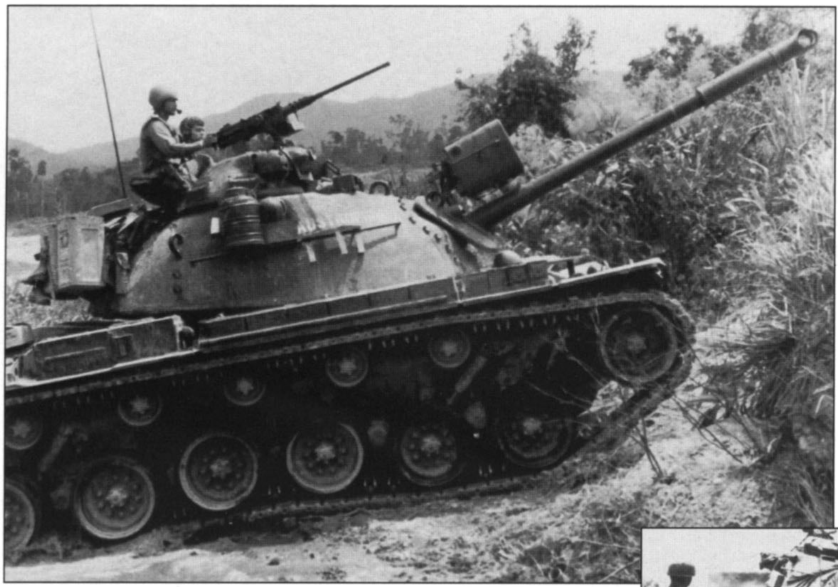




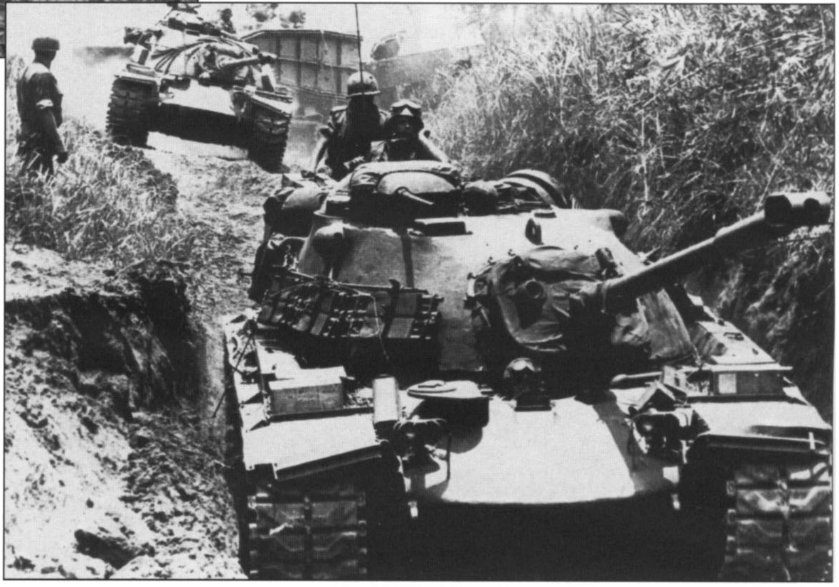
Like earlier variants of the M48 tank series the M48A3 retained the 90mm gun as its main armament. The gun's maximum firing rate with a well-trained crew was 8 rounds per minute. This is an U.S. Army M48A3 tank from A Company, 69th Armor moving into position during "Operation Pershing". Notice the early-model AN-VSS-1 18 inch diameter (white light only) searchlight above the 90mm gun. This model searchlight was first used during the Korean War. In Vietnam, it would quickly be replaced by a new (larger) Xenon searchlight that had both white light and infra-red capabilities.



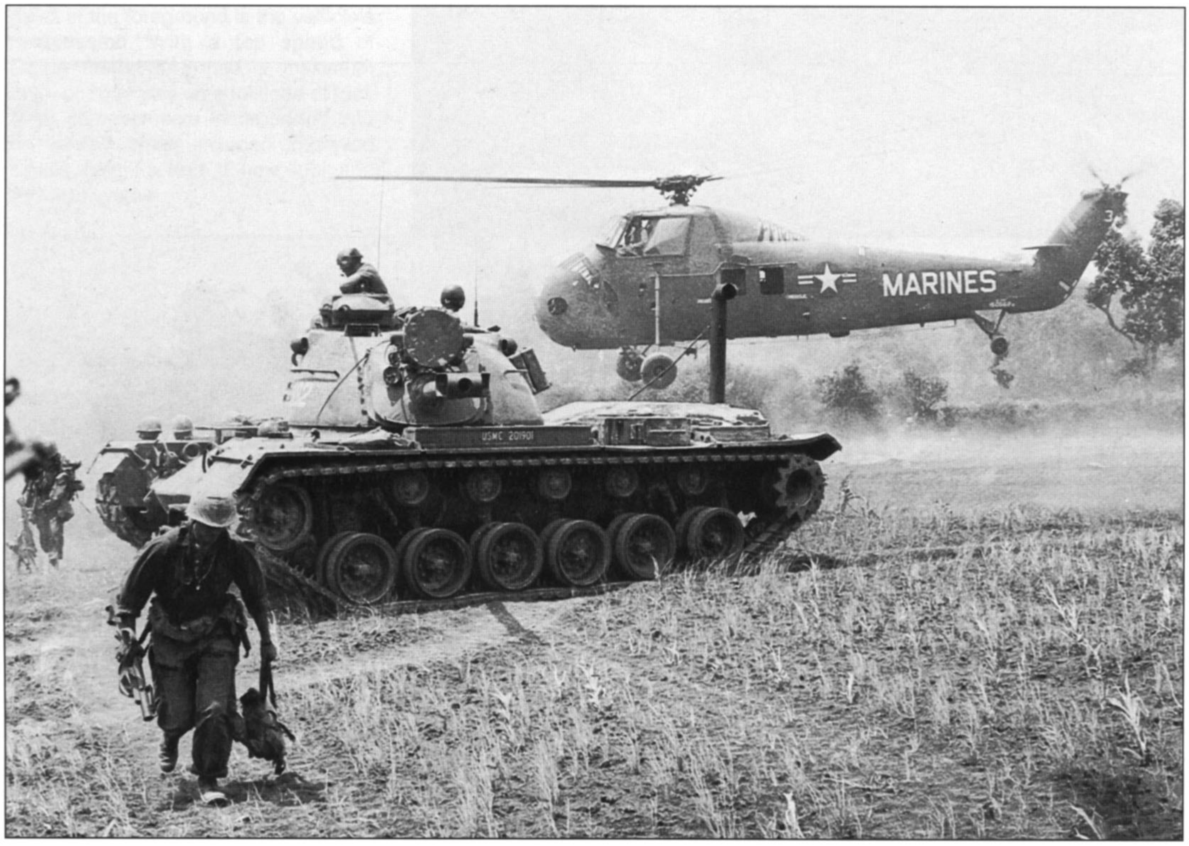
Taken in June 1966, during "Operation Incinerator," this picture shows Marine Corps tankers cleaning the 90mm barrel of one of their M48A3 tanks. Both tanks are still fitted with the early model (white light only) 18 inch diameter searchlights. Secondary armament on the M48A3 tank normally consisted of a M2 .50 caliber machine gun (heavy barrel) mounted in the tank commander's cupola and a M73 coaxial 7.62mm machine gun mounted alongside the 90mm main gun.



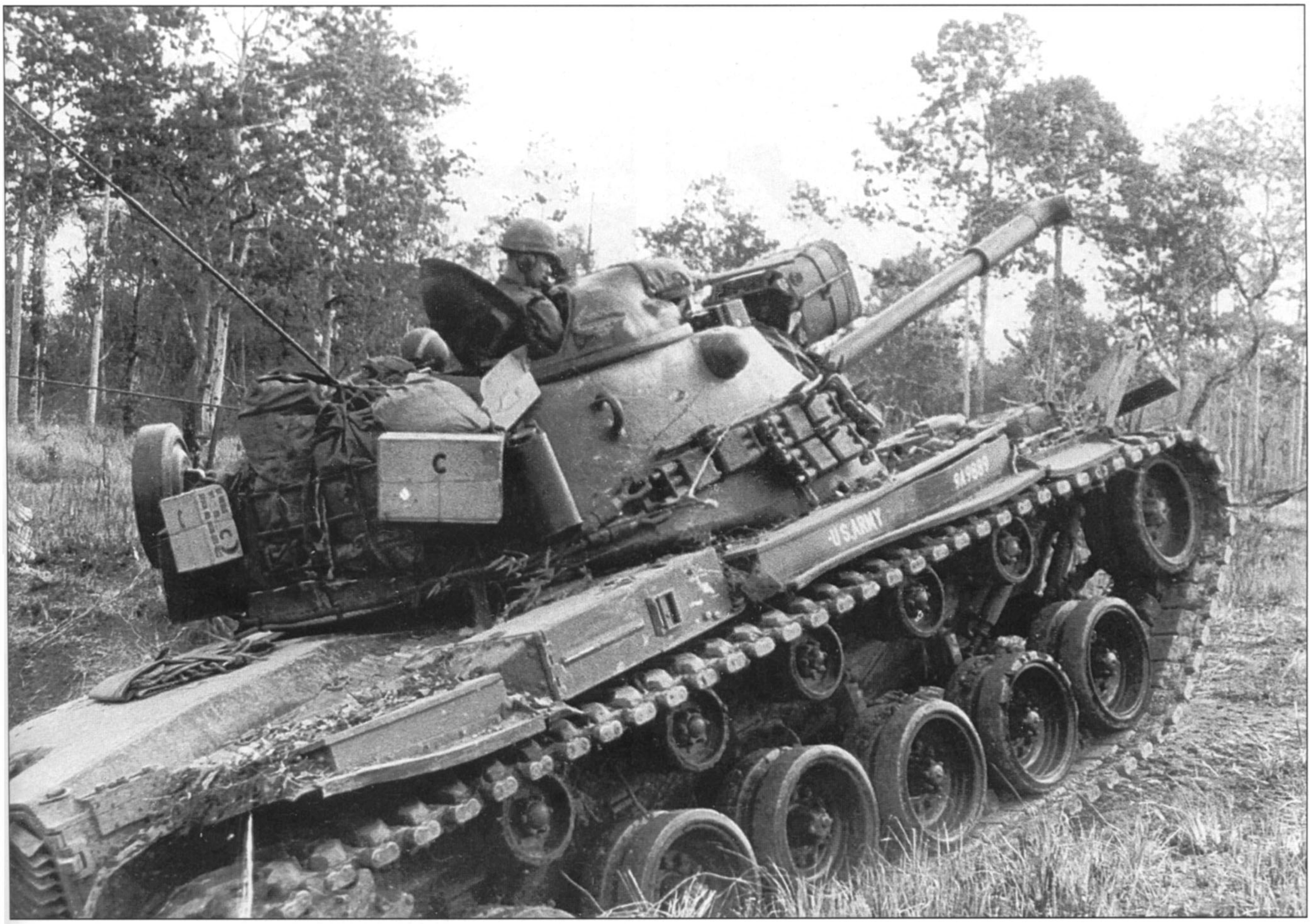
Combat experience in Vietnam showed that the original M1 armored cupola on the M48A3 tank was too small and cramped for the vehicle's commander to use the onboard .50 caliber machine gun effectively. Many tank crew in Vietnam would remount the vehicle's .50 caliber machine gun on a pedestal welded to the cupola roof. An example of such a modification is seen in this picture. Also plainly visible in this side view of an M48A3 tank is the large box-like air filter mounted three quarters the way down on the vehicle's fender.



While the 90mm M41 main gun as mounted on the original M48A1 tank was retained in the converted M48A3 models, the ammunition stowage was revised to include two additional rounds bringing the total number of main gun rounds stored onboard an M48A3 tank to 62. The turret and turret platform of the M48A3 tank was also modified and the early Oilgear turret control was replaced by the Cadillac Gage system. A new waterproof gun shield cover (as seen in this photo) and a nylon inner ballistic shield was also provided.



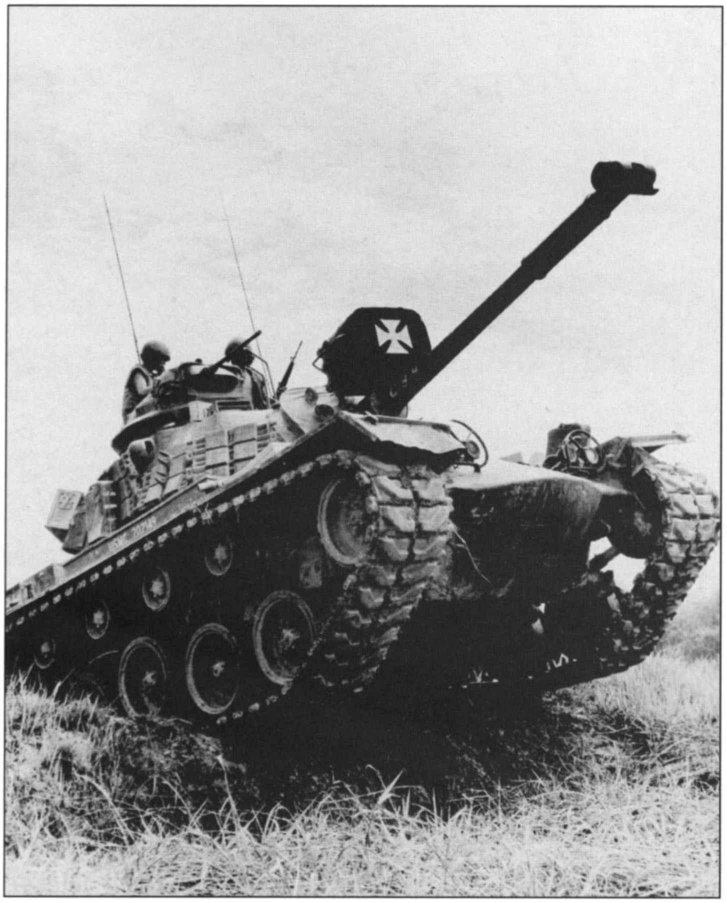
It was originally planned that the M48A3 tank would be fitted with the same 105mm gun as found on all models of the M60 tank. But, last minute funding problems and due to a large supply of 90mm gun ammunition still being in the Army supply system it was decided not to mount the 105mm gun on the M48A3 tank. Instead, the 90mm gun was retained on the M48A3 tank. Combat experience in South Vietnam showed that the M48A3's 90mm gun had a devastating effect on both enemy bunkers and personnel using high explosive and canister ammunition. Pictured is an Marine Corps M48A3 tank of the 3rd Tank Battalion in August 1965.



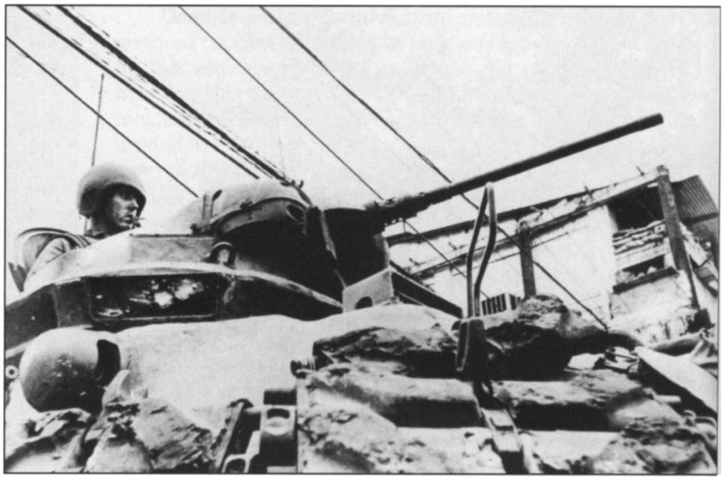
The U.S. Army converted, at its Anniston and Red River Army Depots, 600 M48A1 tanks to the M48A3 model in 1963. The Army also converted another 419 M48A1 tanks into M48A3 tank models for the U.S. Marine Corps by late 1964. Most of these tanks were later deployed to South Vietnam and saw action both with the United States and South Vietnamese forces. Pictured is an Army M48A3 tank from L Troop, 3rd Squadron, 11th Armored Cavalry Regiment during "Operation Junction City" in April 1967.

Due to the growing intensity of the war in South Vietnam and the use of armored vehicles becoming more widespread, it was obvious that additional M48A3 tanks were needed. Because of the heavy workload at the Army depots, a commercial contractor was used to convert an additional 578 tanks to the M48A3 standard starting in 1967. Pictured are two U.S. Army M48A3 tanks of C Company, 2nd Battalion, 34th Armor advancing during a search and destroy mission in January 1967 during "Operation Cedar Falls."

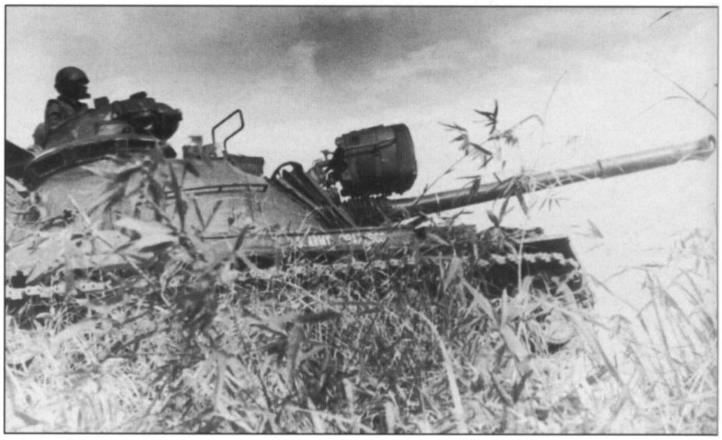
`The M48A1 tanks modernized to the M48A3 standard by the commercial contractor (Bowen McLaughlin Company of York, Pennsylvania) featured numerous product improvements not available to the earlier Army M48A3 rebuild program. To differentiate between the two, the later vehicles were referred to as the M48A3 (Model B). Pictured is an M48A3 (Model B) tank almost completely covered with jungle undergrowth. Weighting over 50 tons combat-loaded the M48A3 tank was a great jungle buster. Unfortunately, the use of the vehicle in this role would normally be very hard on both the vehicle's suspension system as well as its power pack.



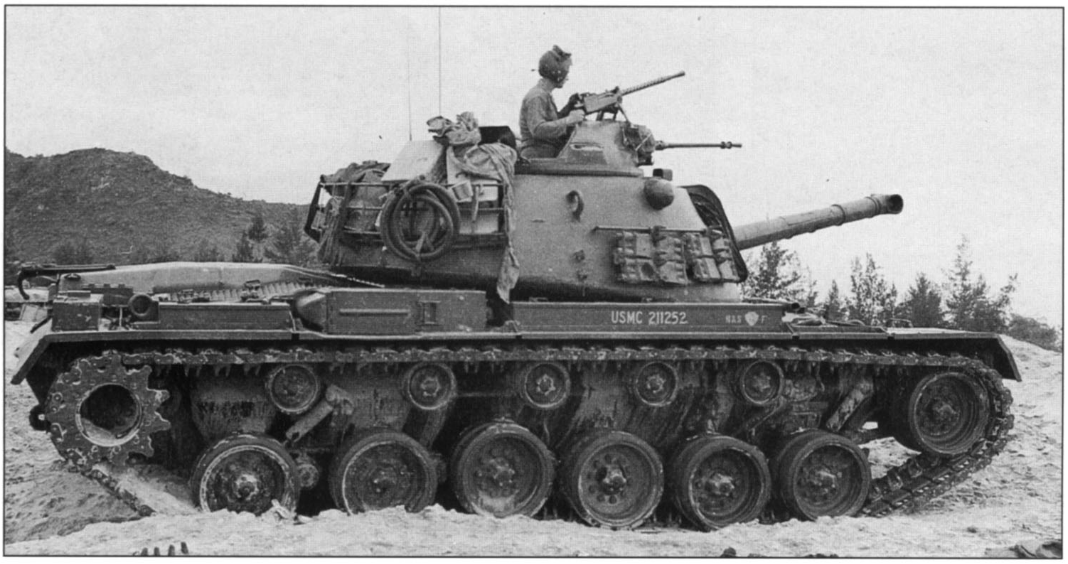
The M48A3 (Model B) tanks converted by the civilian contractor included many of the latest M60A1 tank components such as the driver's controls and instruments. Other features were changed due to American military experiences with antitank mines in South Vietnam. As an example, it was decided to relocate fuel lines from the bottom of the vehicle's hull to a safer position alongside the vehicle's hull armor. To improve communications between tank crews and accompanying infantry a raised fender telephone box was added to the rear of the vehicle. Pictured is an M48A3 (Model B) tank from the Marine Corps during "Operation Pipestone Canyon" in June 1969.



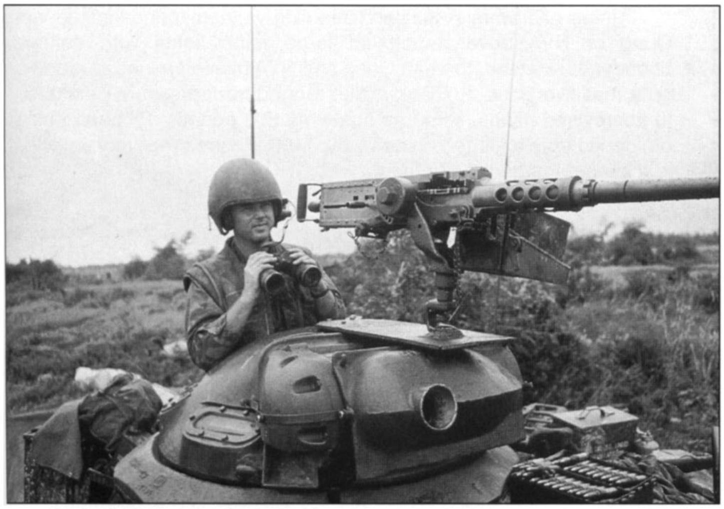
The most obvious visual clue to distinguish the (Model B) tanks from the earlier rebuilt M48A3 was in the commander's cupola. A spacer ring G305 (as pictured) with nine large vision blocks was installed between the cupola and the turret. This greatly improved the tank commander's all round vision as well as the head room inside the cupola. This close up view shows an Marine Corps M48A3 tank of the 1st Battalion, 5th Marines in South Vietnam in 1968. The circular object under the tank commander's cupola, with the small opening, is the armored housing for the vehicle's M17B1C coincidence range finder.



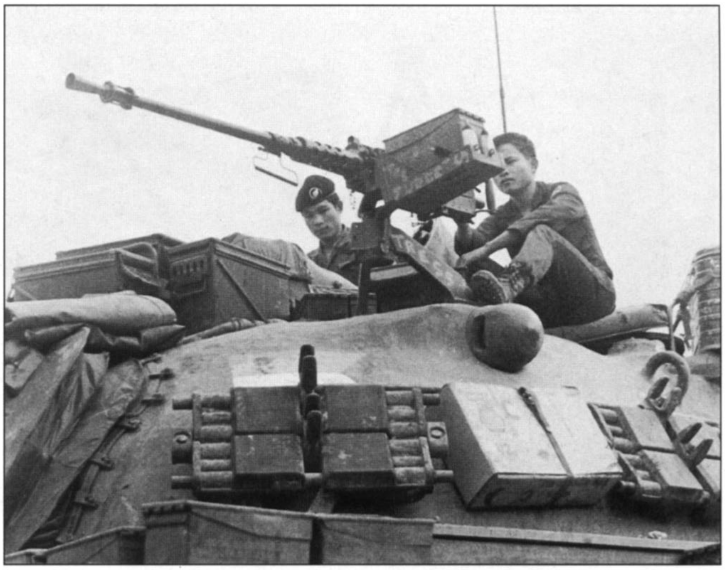
The cupola on the M48A3 (Model B) tank was also improved by the addition of a new bulged-out hatch cover. Unlike the original hatch on earlier model of the M48A3 tank, the new hatch cover did not incorporate any vision blocks. Pictured is a U.S. Army tank commander in his M48A3 tank from C Company, 1st Battalion, 69th Armor in South Vietnam in 1969. The .50 caliber machine gun is missing from this vehicle. Visible however, is the heavy gauge metal turret interrupting bar which was designed to prevent the tank commander from shooting his onboard searchlight in the heat of combat.



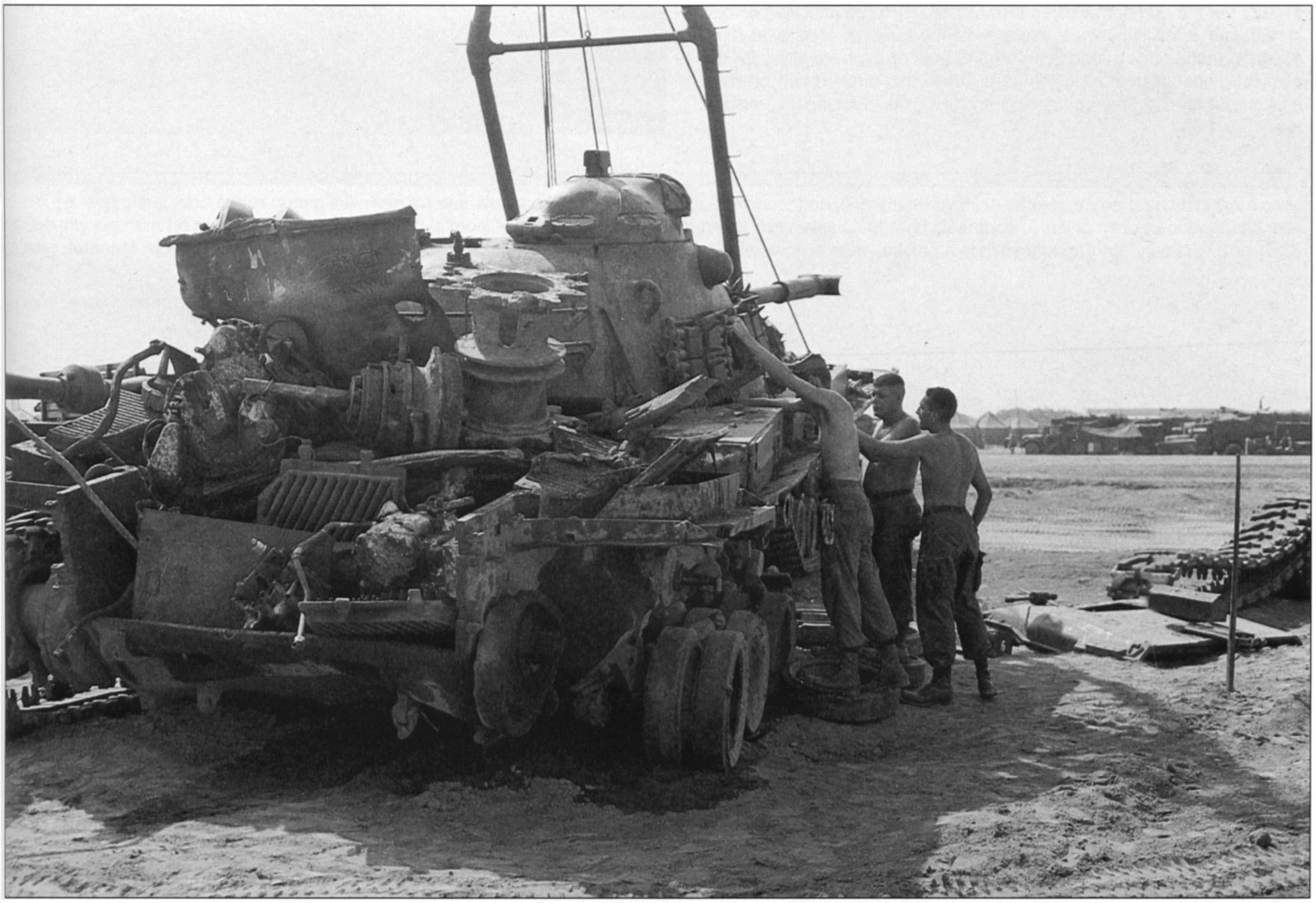
The necessity for the cupola modifications had been emphasized by combat reports from South Vietnam. The previous model cupola was too small and cramped for the tank commanders to really use their .50 caliber machine gun effectively. To get around this problem, the crews of some early model M48A3 tanks would mount various types of machine guns on the top of the commander's cupola. The weapon was then fired by the tank commander from the open hatch position. Pictured is the flame thrower version of the M48A3 tank (known as the M67A2) in South Vietnam. The vehicle's crew has added a makeshift bracket to mount a .30 caliber Browning machine gun on top of the tank commander's cupola.



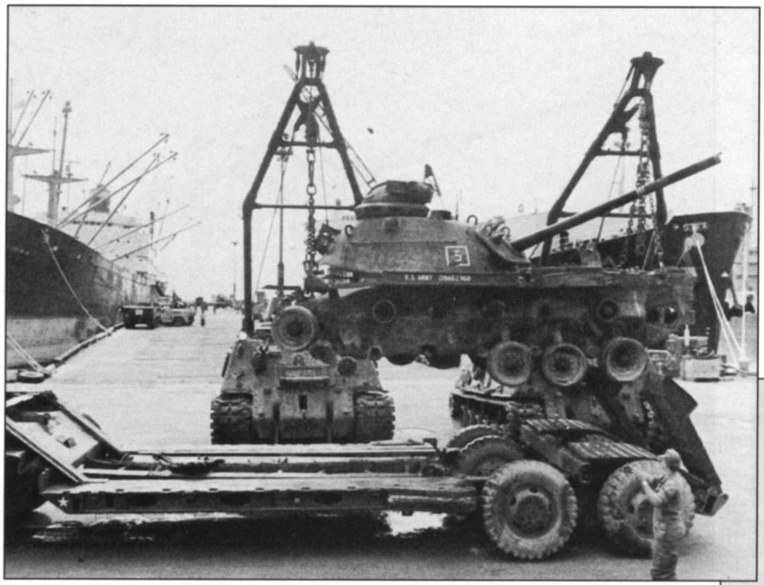
The new cupola of the M48A3 (Model B) was not seen as a big improvement by the troops in the field and most tank crews tended to mount various types of machine guns (normally a .50 caliber machine gun) on the top of the tank commander's cupola. The actual mounting attachments varied from unit to unit or even tank to tank sometimes. There was never a standardized mounting bracket produced.



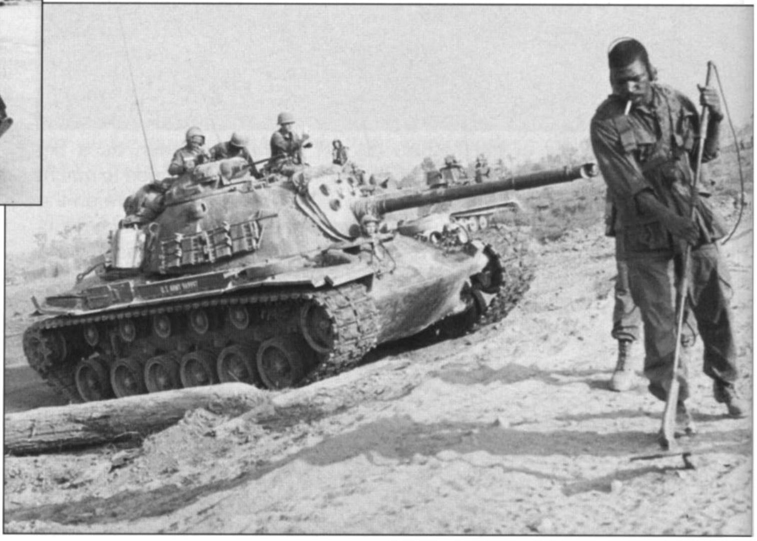
Not all crews of M48A3 tanks in the Vietnam War mounted machine guns on top of their tank commander's cupolas. The crew of the ARVN M48A3 tank pictured has fitted a .50 caliber machine gun and its mount in front of the vehicle's loader hatch. The reason for this arrangement is unknown. This vehicle could have been a command tank. With less need to service the vehicle's main gun it might have been felt that the loader could be more helpful manning the vehicle's onboard turret mounted machine gun.



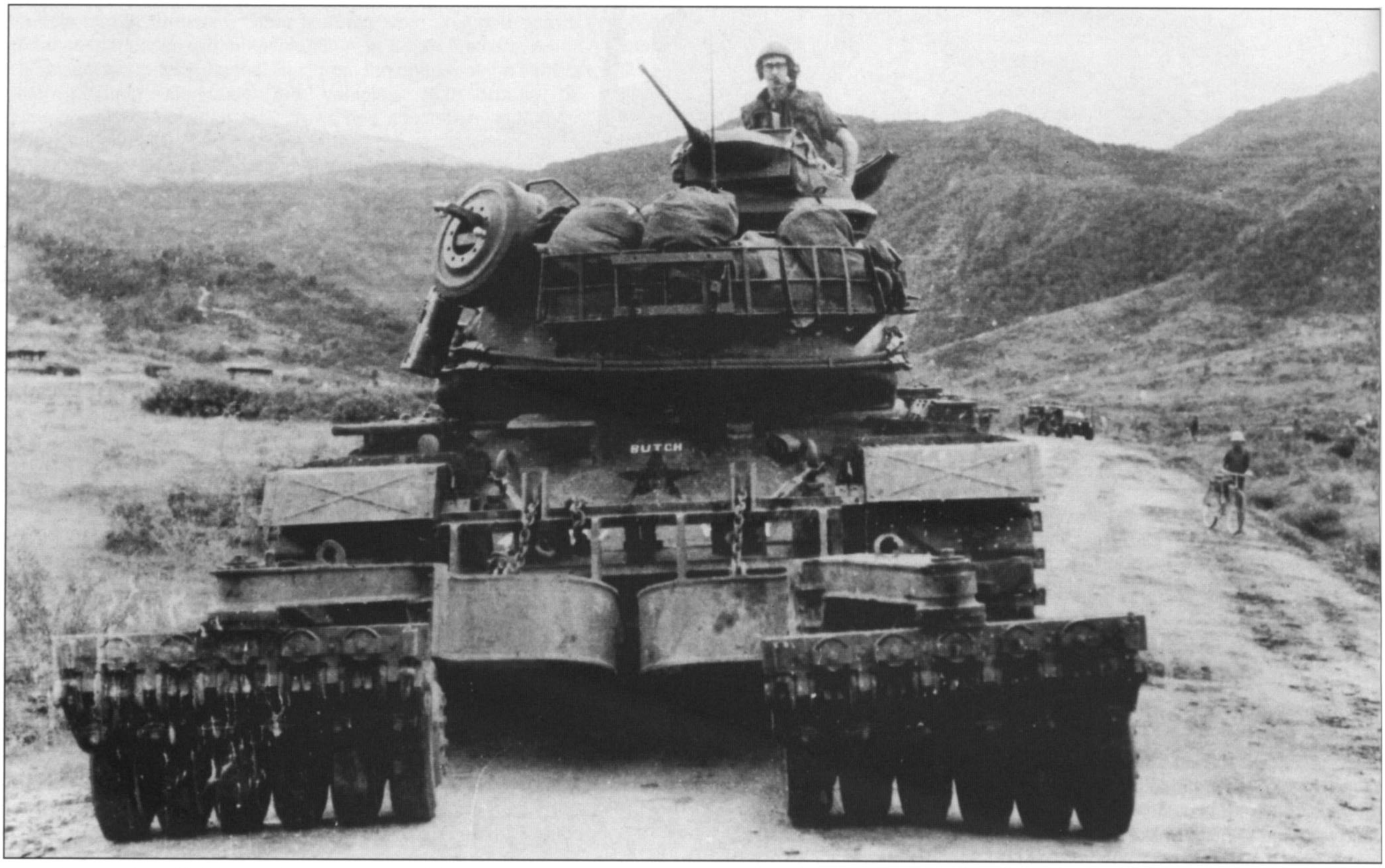
The biggest threat to the M48A3 tank, as well as all other armored vehicles, during the Vietnam War was the explosive anti-vehicular mine. For example in June 1966, a battalion of the 5th Infantry (Mechanized), lost fourteen M113s to mines in eight days of operation. Only eight of the M113s could be repaired and returned to duty. Unlike the M113, when an M48A3 tank ran over a mine the vehicle's thick hull armor proved capable of absorbing the shock of a mine explosion. Pictured is what's left of an M48A3 tank after running over a 500 pound home-made VC mine. The entire rear hull engine compartment has been ripped apart. Because tanks like the M48A3 could absorb the blast of most enemy antitank mines without loss of life to the crew, it was normal practice in Vietnam to allow the Patton tanks to lead in clearing operations or reconnaissance in force. A study of the six-month period from November 1968 to May 1969 found that throughout Vietnam 73 percent of all tank losses and 77 percent of all armored personnel carriers losses were caused by mines. (Rob Steward)



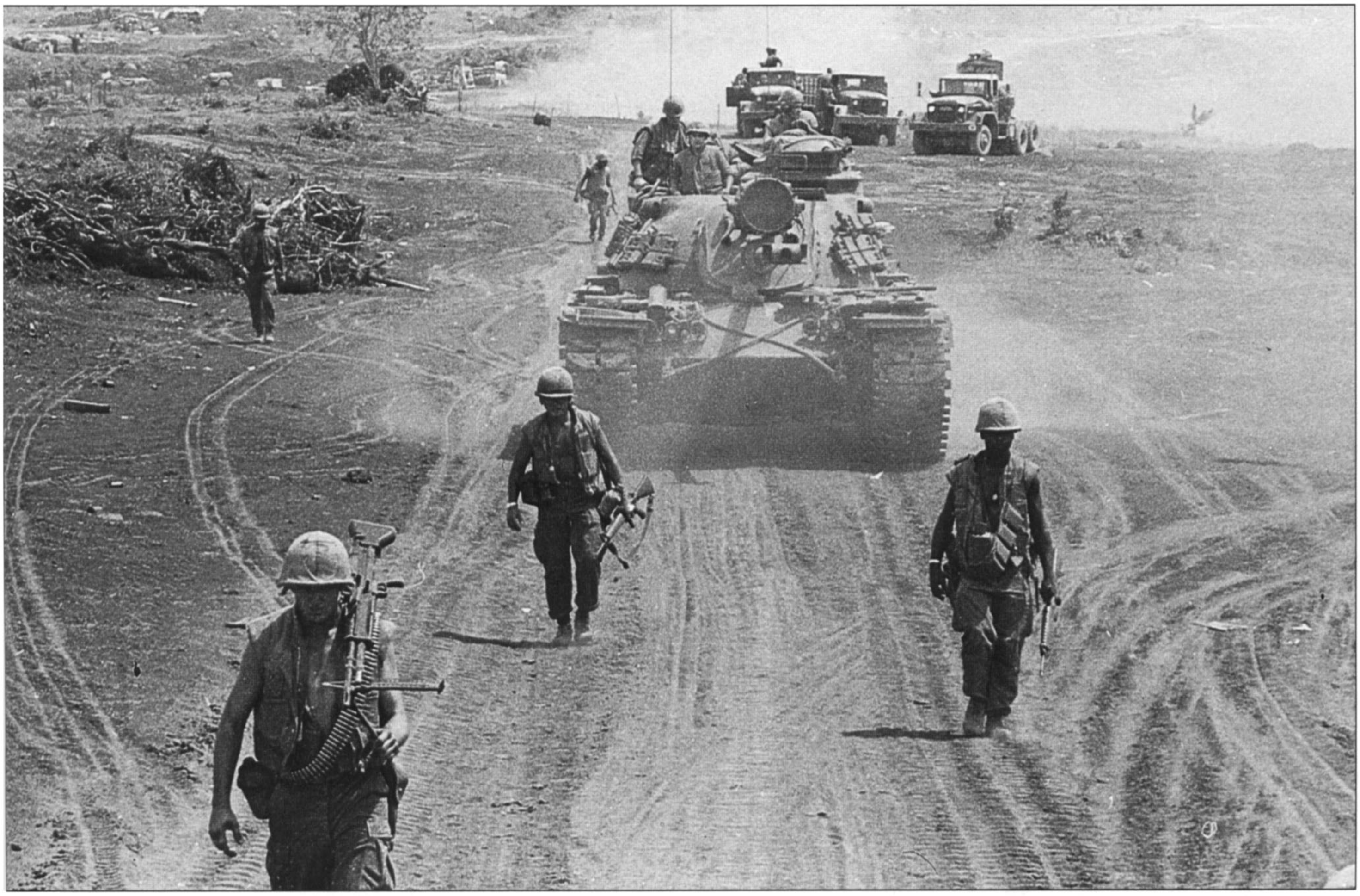
Unlike past wars, American tankers in Vietnam found that the Viet Cong or NVA never employed large mine fields with definite boundaries. Instead, the Viet Cong and NVA planted mines at random on a massive scale. Antitank mines ranged from pressure-detonated to improvised mines, some as heavy as 250 pounds. Pictured being off-loaded from a flatbed trailer by two M88 armored recovery vehicles is a mine-damaged M48A3 tank.



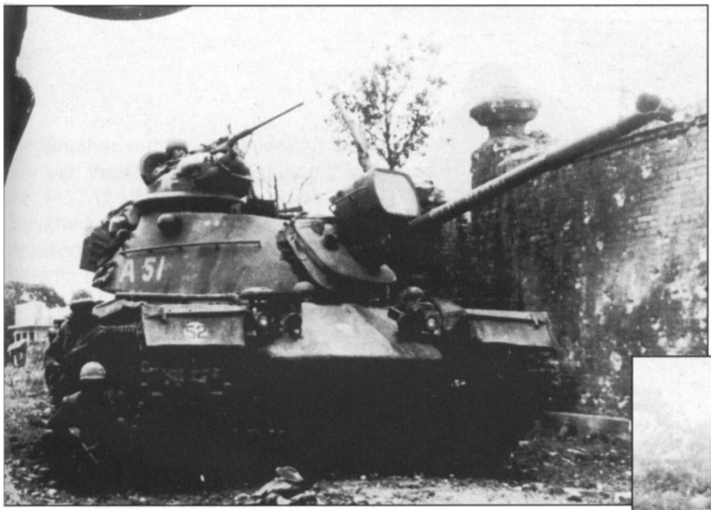
To deal with the enemy mine threat in South Vietnam, the U.S. military used a number of different methods. Pictured checking a road in Vietnam is an American soldier equipped with a electronic mine detector. In the background is an M48A3 tank and crew waiting for the all clear signal before using the road. While this method can be fairly effective, it is also time-consuming and exposes personnel to enemy fire.



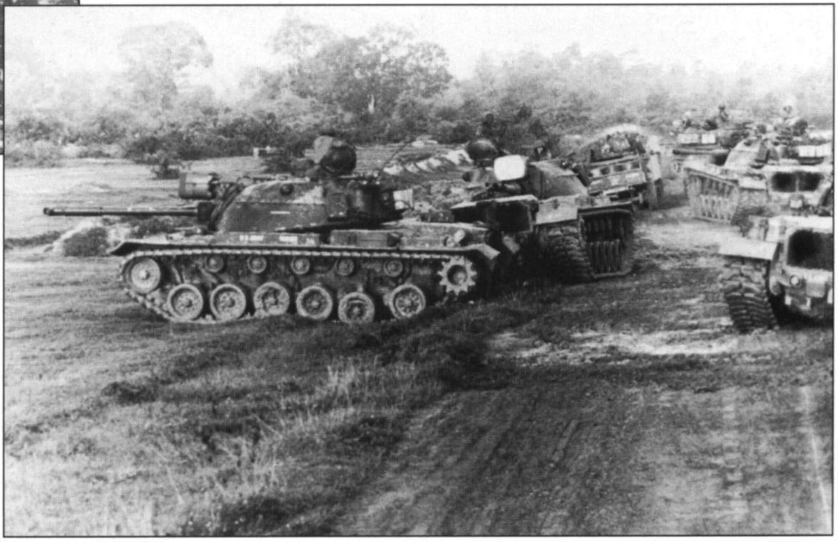
Because hand-held mine detectors slowed down every vehicle to the pace of a slowly walking soldier, American field commander asked for a better device that could detect or destroy low-density mines on roads and that could move faster than a man carrying a hand-held mine detector. U.S. Army designers came up with an expendable mine roller as pictured here on the front of an M48A3 tank in Vietnam in August 1970. Eventually, twenty-seven of these 20 ton devices (known as the ENSURE 202 mine clearing rollers) were shipped to South Vietnam.



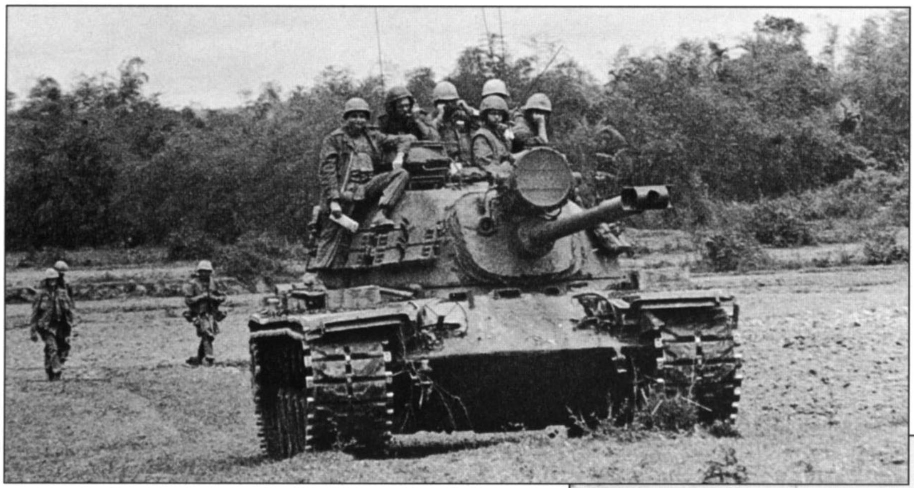
In general, most road mines during the Vietnam War were spotted by alert armor crewmen than were found by mine detectors. Armored units were often the security element for mine clearance teams, and in most areas of South Vietnam had a daily mission of road clearance by using mine sweepers and their tanks to detonate hidden mines. This Marine Corps M48A3 tank of the 3rd Marine Tank Battalion is seen leading a convoy along Route 9 west of Con Thein in July 1967.



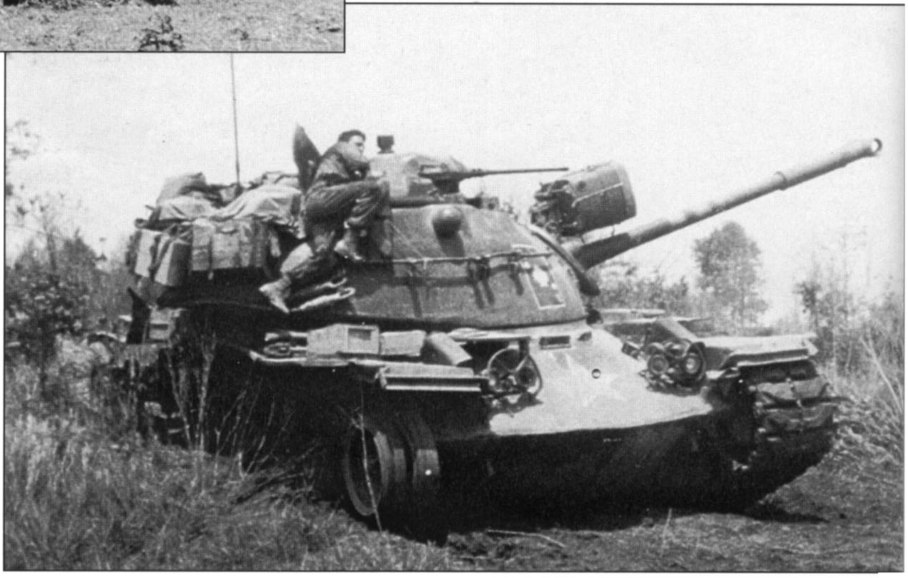
The hull of the M48A3 tank was made of cast homogeneous steel ranging in thickness from about 4 inches at the front of the hull to about 1 inch of armor at the rear of the vehicle. An escape hatch for the driver was located below the driver's seat in the hull floor. This photo of a Marine Corps M48A3 tank is taken during the 1968 battle for the South Vietnamese city of Hue.



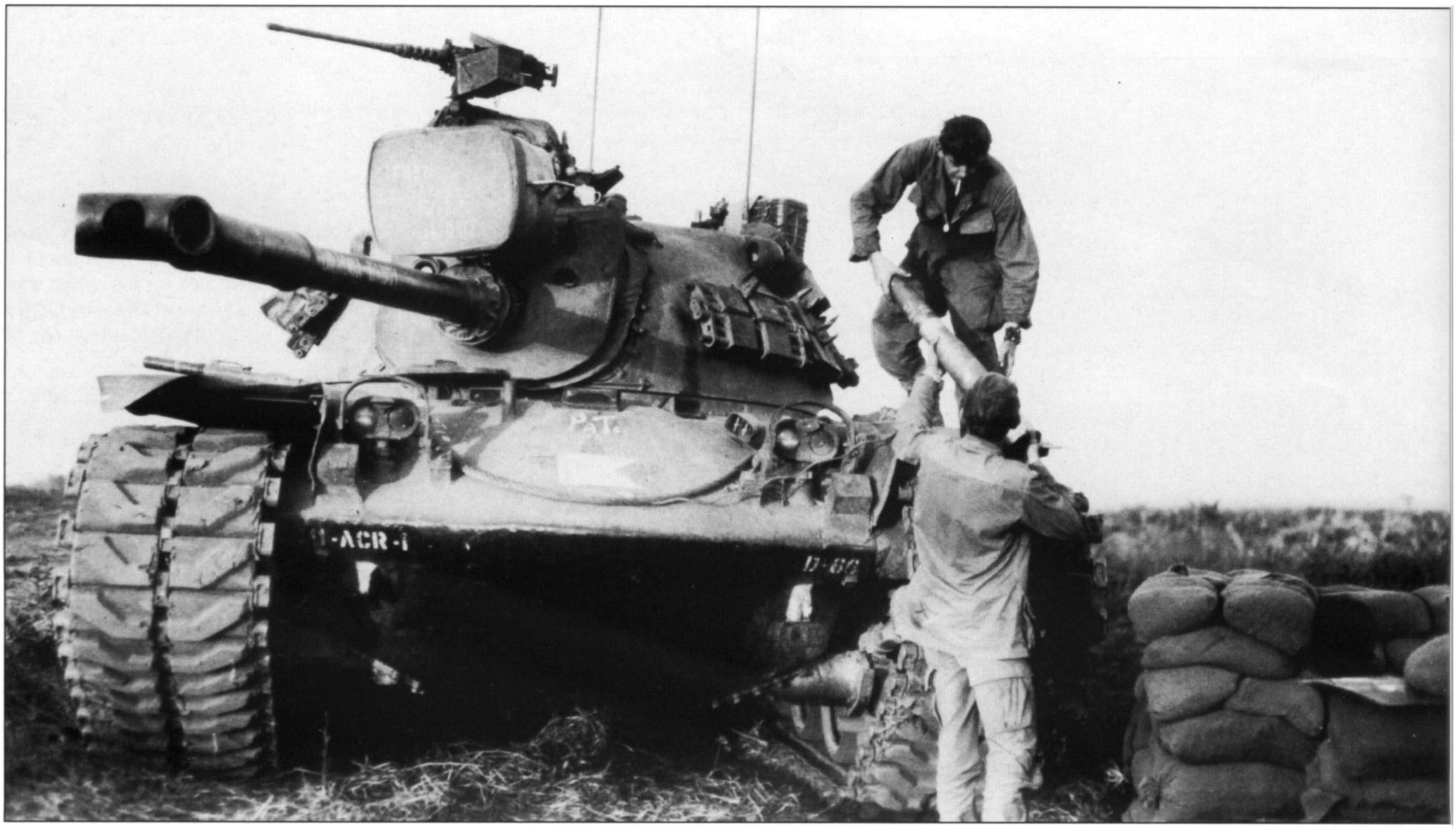
The M48A3 tank was equipped with a transverse torsion bar-type suspension which by means of individually suspended road wheels (six pairs) that were supported by support arms attached to the torsion bars, which gave the vehicle optimum riding characteristics over all types of terrain. The M48A3 tanks pictured, from the 11th Armored Cavalry Regiment, are deploying in a herringbone formation to protect themselves from an enemy ambush.



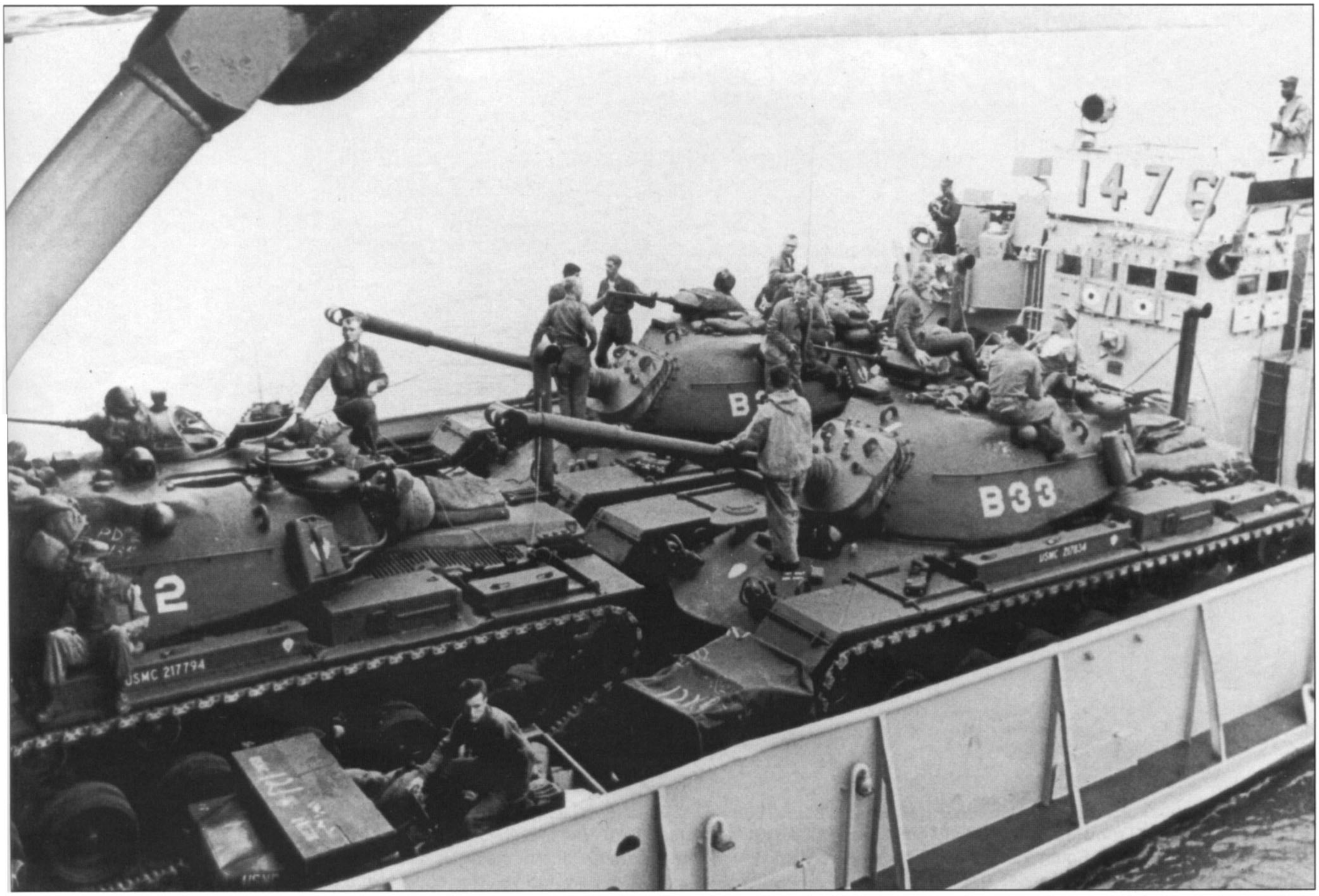
The turret of the M48A3 tanks was made of a one-piece homogeneous armor steel casting. Armor thickness at the front of the turret was 7 inches. The turret sides were 3 inches thick. The turret rear was 2 inches thick, while the turret roof itself was 1 inch thick. Pictured in South Vietnam is this Marine Corps M48A3 tank fitted with the Korean War vintage (round) searchlight.



Externally, the turret had racks for stowing miscellaneous items such as a 5-gallon water can, combat packs, xenon searchlight and towing cables. Internally, racks were provided for stowage of items such as periscopes, binoculars, flashlights, canteens, rations, ammunition and various hand tools. This M48A3 tank has lost a track to a mine. Visible is the incredible amount of stuff the crew has piled in and on the vehicle's rear turret stowage rack.

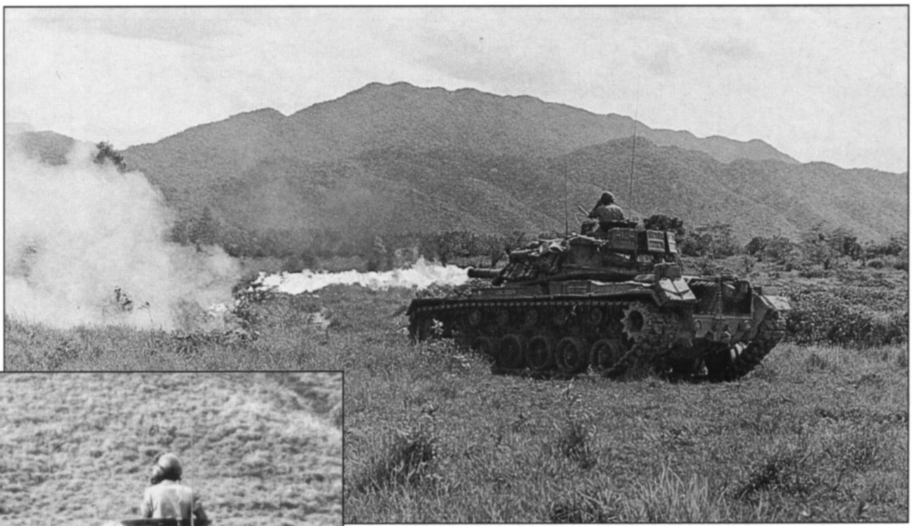


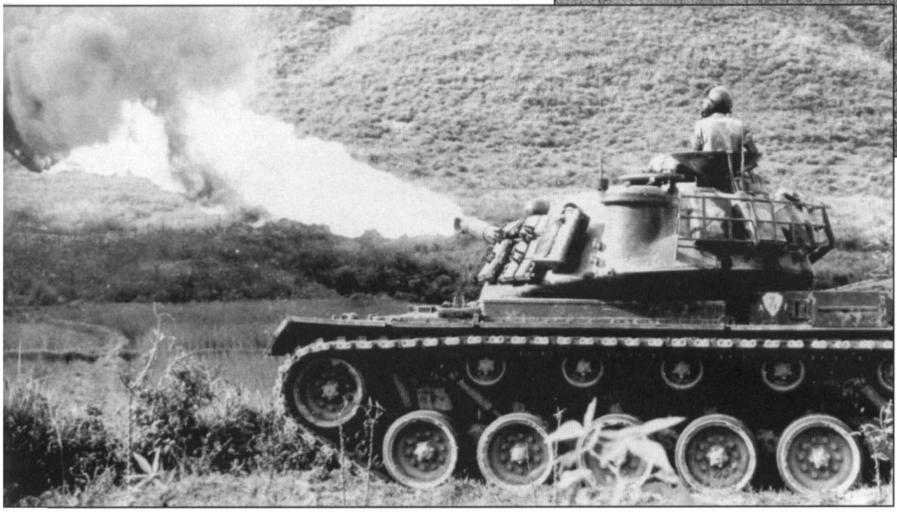
The 90mm gun of the M48A3 tank could fire a wide range of different ammunition types. For tank against tank combat, the gun could use either kinetic energy rounds or a HEAT shaped charge round. During the Vietnam War where there was little chance that American tanks would have to face off against enemy tanks, the average M48A3 tanks would carry 27 rounds of canister ammunition, 28 rounds of high explosive (HE) and a few white phosphorous rounds. The crew of this M48A3 tank of the 11th Armored Cavalry Regiment is loading up their vehicle with high explosive main gun rounds.



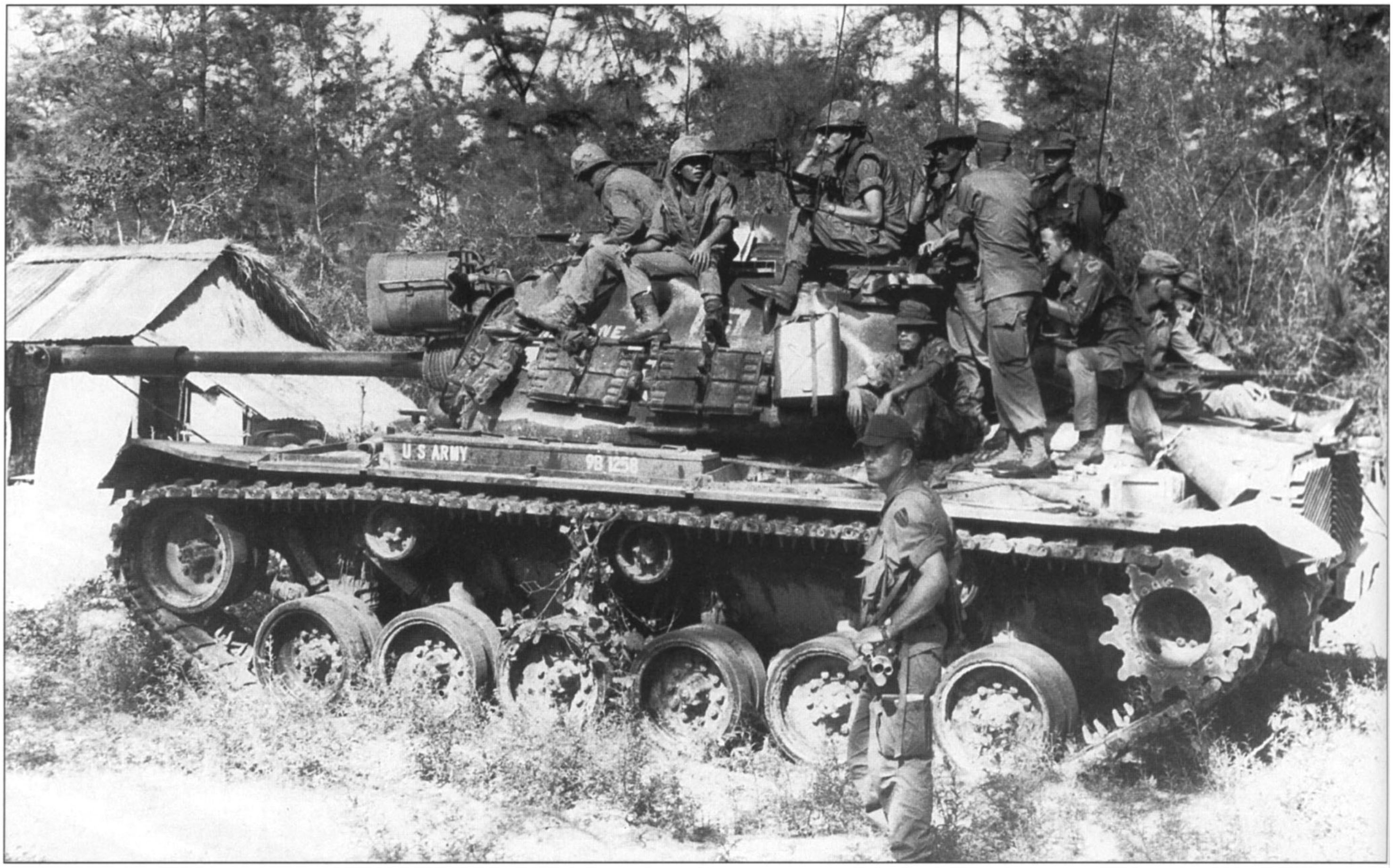
The first M48A3 tanks deployed to South Vietnam did not belong to the U.S. Army, but to the U.S. Marine Corps. On March 9, 1965 elements of the 3rd Marine Tank Battalion were landed in South Vietnam. By July 8, 1965 the remainder of the 3rd Marine Tank Battalion would join their fellow tankers. This naval landing craft is loaded with M48A3 tanks of the 3rd Marine Tank Battalion and is heading towards the shores of South Vietnam in March 1965.

Another version of the M48A3 tank that saw service only with the Marine Corps during the Vietnam War was the M67A2 flame-thrower tank. The M67A2 were converted M48A3s with their 90mm gun and ammo removed to make room for a large flame gun and fuel system.

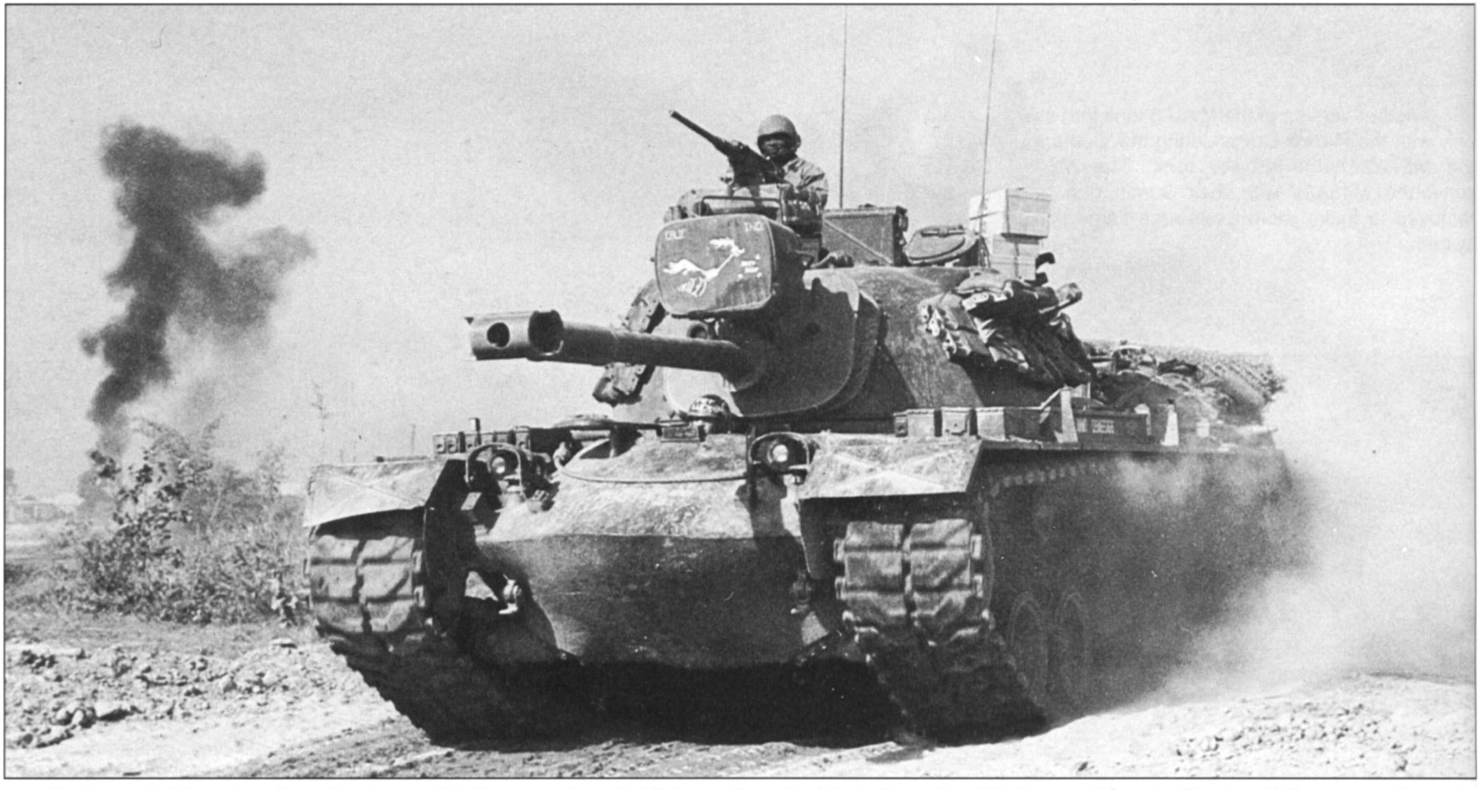




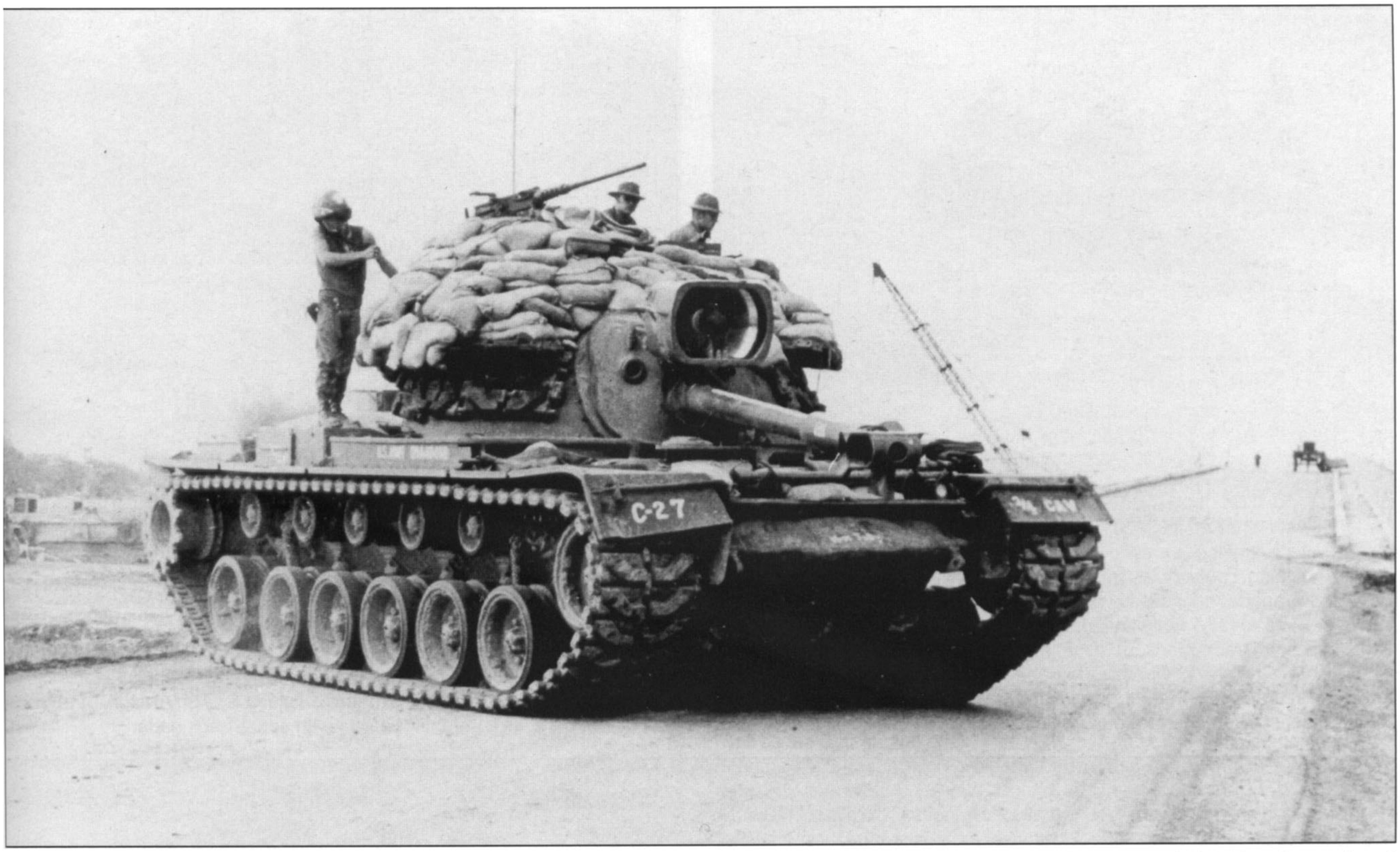
To avoid being singled out as a flame-thrower tank, the M67A2 sported a dummy barrel to simulate that of a standard M48A3 Marine Corps tank. While the dummy barrel did make the M67A2 look like a regular M48A3 tank from a distance, one could distinguish the difference close-up due to the dummy barrel being shorter and thicker than the standard 90mm gun tube.



While the M48A3 remained the standard American tank during the Vietnam War, due to high losses of armored vehicles, a few M48A2 tanks were used by the American forces in South Vietnam. They proved very unpopular with the troops due to their gasoline engines. The blast from enemy weapons, like mines and rocket-propelled grenades (RPGs), that would have little effect on diesel-powered vehicles could turn a gasoline-powered vehicle into a flaming torch in seconds. The most obvious visual difference to spot an M48A2 tank from an M48A3 are the number of return rollers. The M48A2 model only had three, while the M48A3 model had five. Another visual feature common to the M48A3 and not seen on the M48A2 tank was the large box-like M60 type air cleaners mounted on the rear fenders of the M48A3 tanks. Pictured is one of the few M48A2 tanks to serve in South Vietnam. The tank belonged to the 1st Battalion, 5th Mechanized Division during "Operation Fisher" on January 6, 1969.

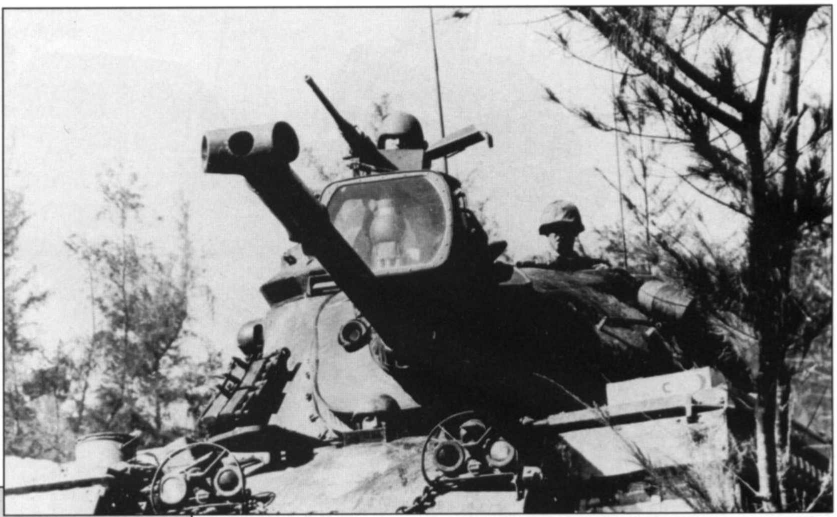


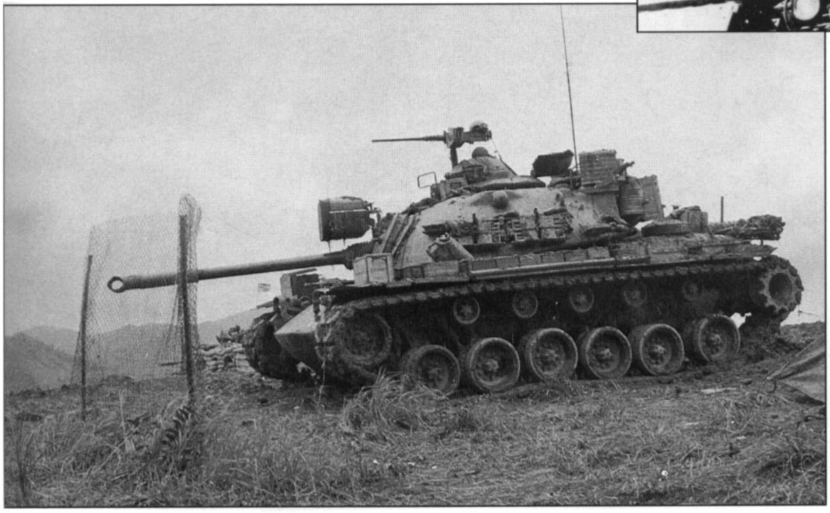
By the end of American Army involvement in the ground war in Vietnam, three tank battalions, the 11th Armored Cavalry Regiment, five armored cavalry squadrons plus a number of individual tank companies and cavalry troops had seen action. This U.S. Army M48A3 tank is seen patrolling a perimeter road in Chu Chi, South Vietnam, in January 1969.



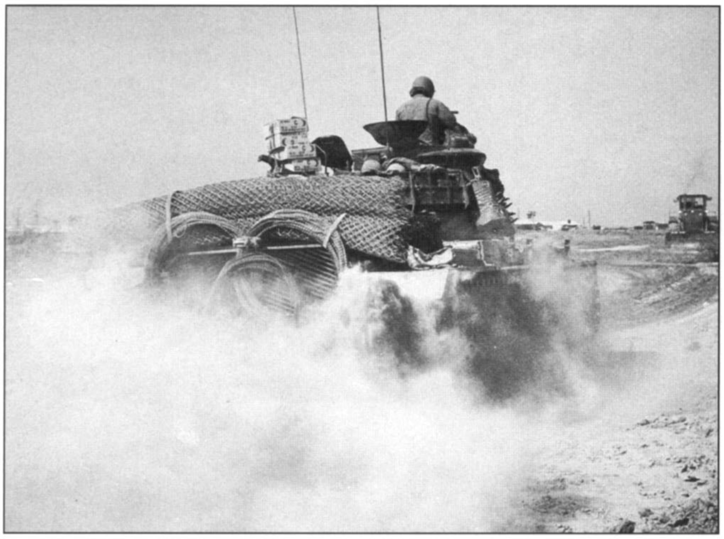
As in most wars, the American tank crew quickly improvised a number of additions and modifications to the tanks. The crews of M48A3 tanks employed in convoy patrol duty often covered their turrets with sand bags to reduce the effect of the shaped charge warheads of the enemy RPGs. The crew of this U.S. Army M48A3 tank had built a small fort of sandbags on the turret of their vehicle. (Jim Loop)

This close-up view of a Marine Corps M48A3 tank, in action during "Operation Badger Tooth" in January 1968, shows in great detail the vehicle's Xenon searchlight as well as the early-production twin headlight groups with brush guards. Within each of the twin headlight groups was a single white light service headlight as well as an infra-red headlight for driving at night. Many late production M48A3 (Model B) tanks would feature a redesigned headlight group with strengthened brush guards.

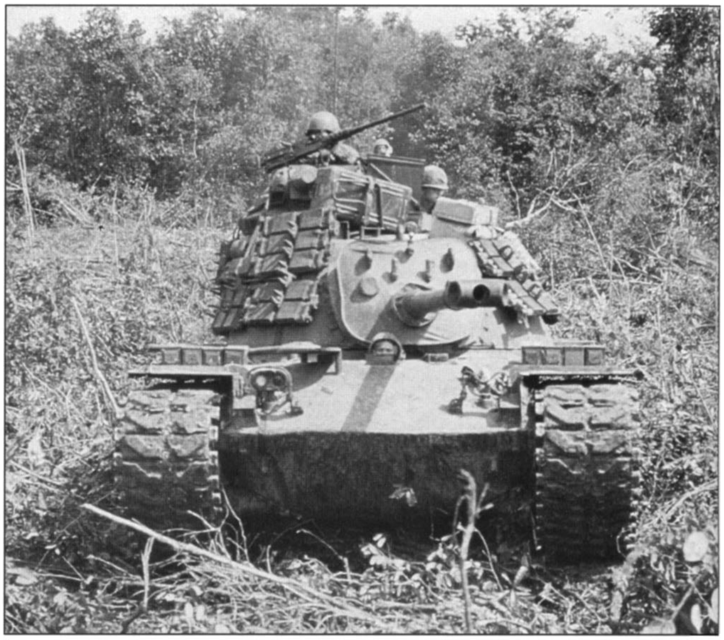




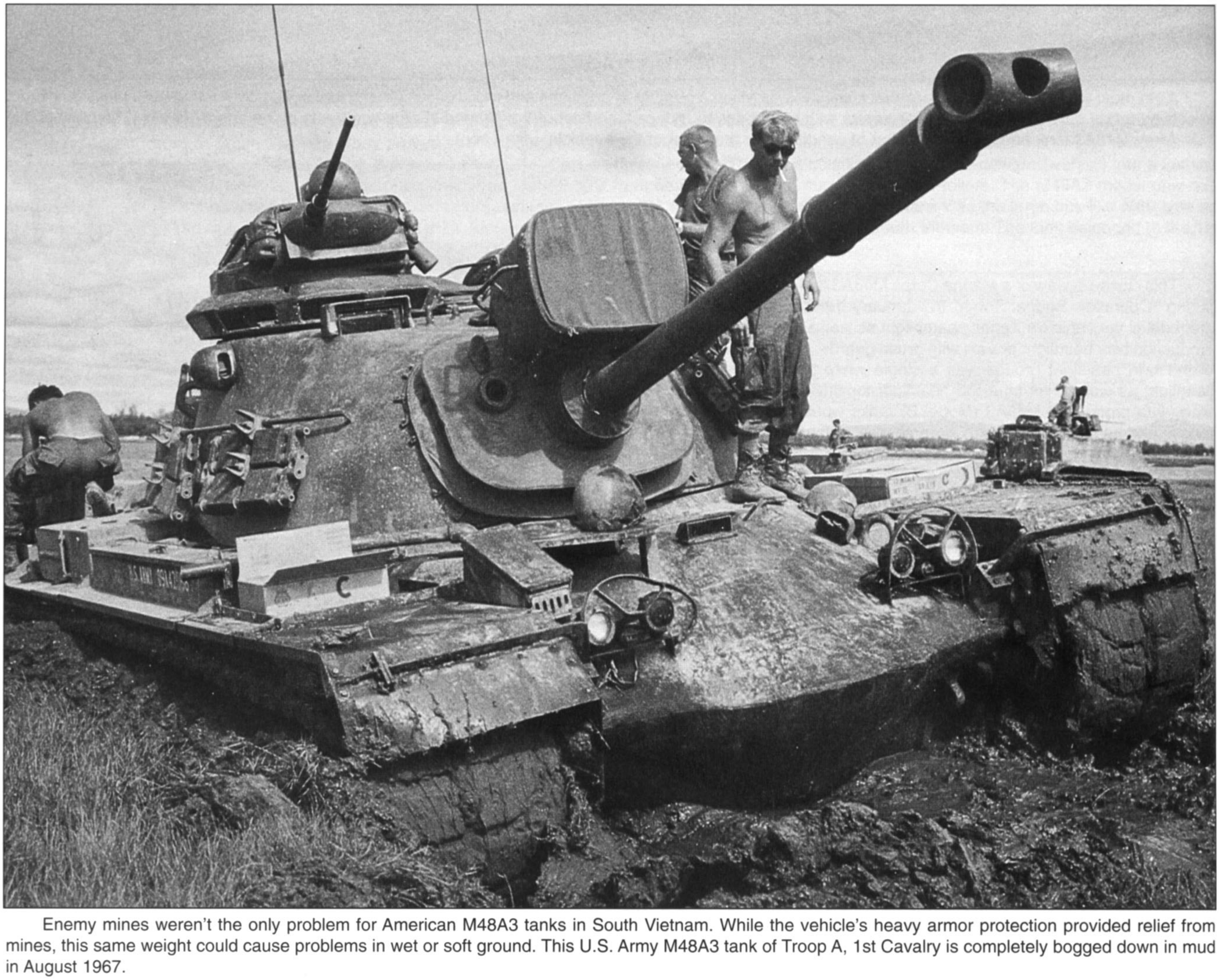
Wide use in Vietnam were chain-link fence, rolls of which were carried on many tanks to protect themselves from RPG rounds. Whenever the M48A3 tanks went into a stationary defensive position, the crews would set up a section of chain-link fence around the vehicle to pre-detonate any RPG-shaped charge warhead before they struck the tank itself. Pictured is an U.S. Army M48A3 tank of C Company, 1st Battalion of the 77th Armor set up in a nighttime defensive position with a cyclone fencing attached to engineer stakes in March 1971.



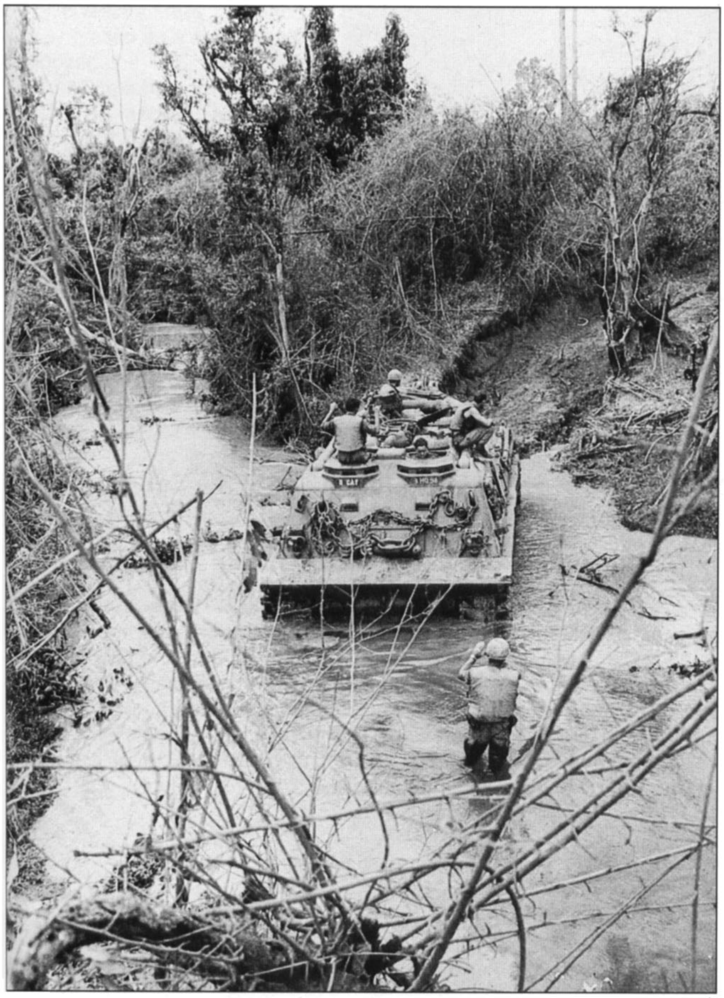
This rear shot of an M48A3 tank in South Vietnam shows just how much cyclone fencing a crew could pile on the rear of their vehicle. Since almost anything could detonate the warhead of the early-model rocket propelled grenade launcher known as the RPG-2, it was common for the crews of most M48A3 tanks in South Vietnam to cover their vehicles with items such as track block or even empty ammo boxes filled with dirt. Unfortunately, for the crews of all armored vehicles in South Vietnam the advent of the newer RPG-7 in the inventory of the VC and NVA tended to render most sure defensive measures useless.



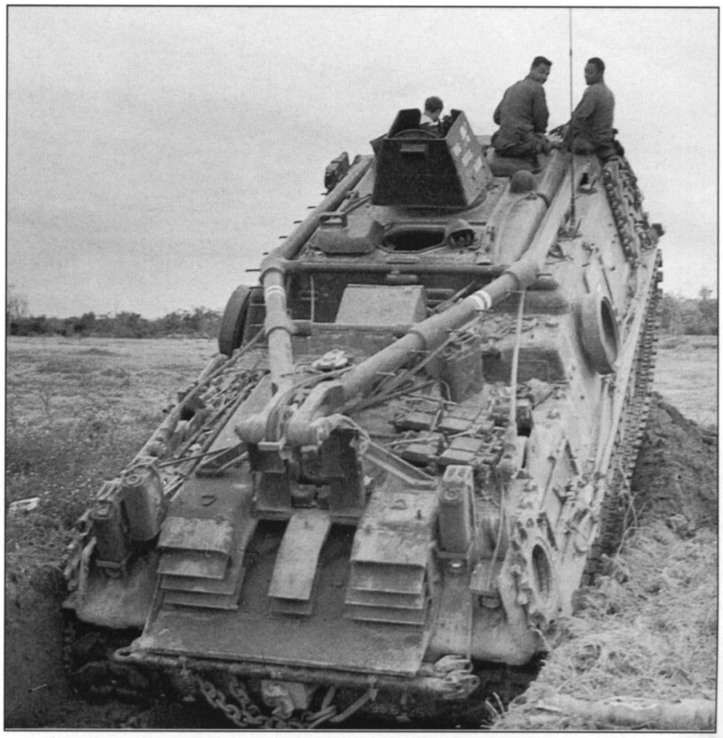
Camouflage in Vietnam was rather pointless for the M48A3 tank since the enemy could hear the tank engines from over two miles away and could pinpoint their position form an even longer range by the thick black smoke coming from the tank engine exhausts. This U.S. Army M48A3 tank crew has covered the turret of their vehicle with spare track pads.



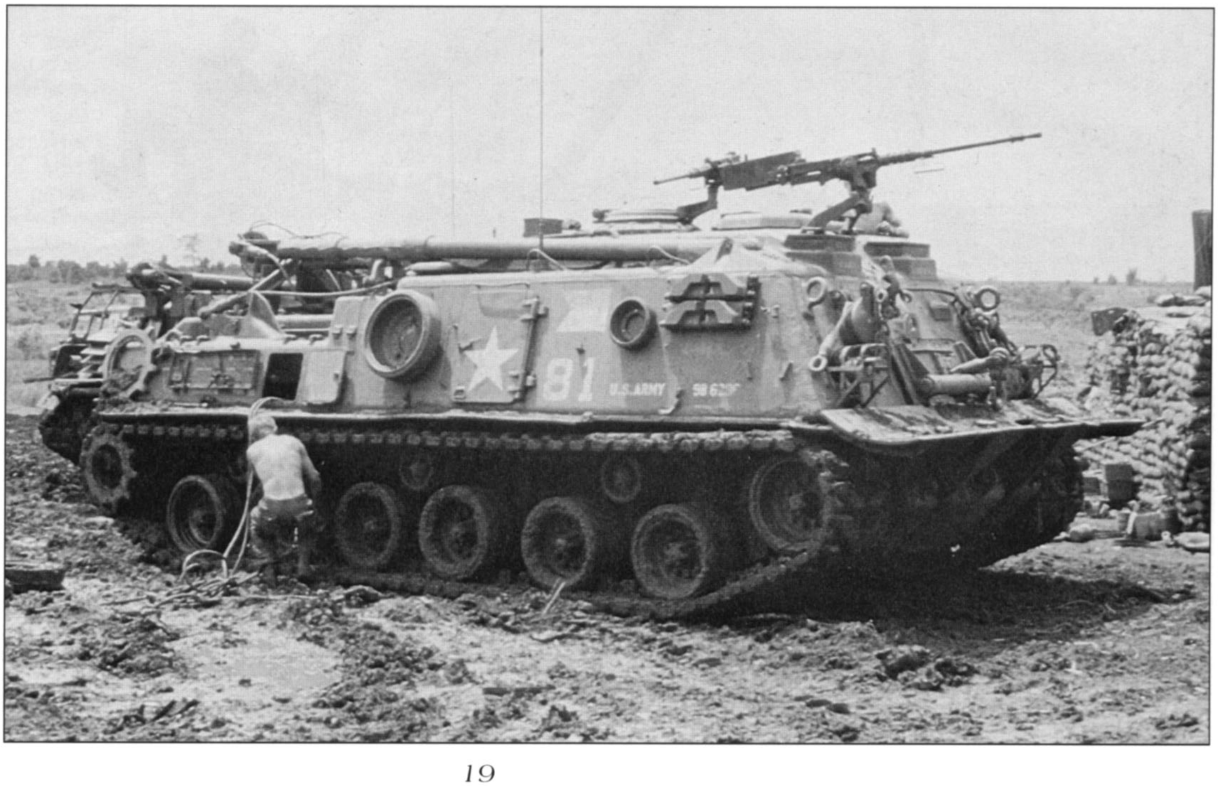
Enemy mines weren't the only problem for American M48A3 tanks in South Vietnam. While the vehicle's heavy armor protection provided relief from mines, this same weight could cause problems in wet or soft ground. This U.S. Army M48A3 tank of Troop A, 1st Cavalry is completely bogged down in mud in August 1967.



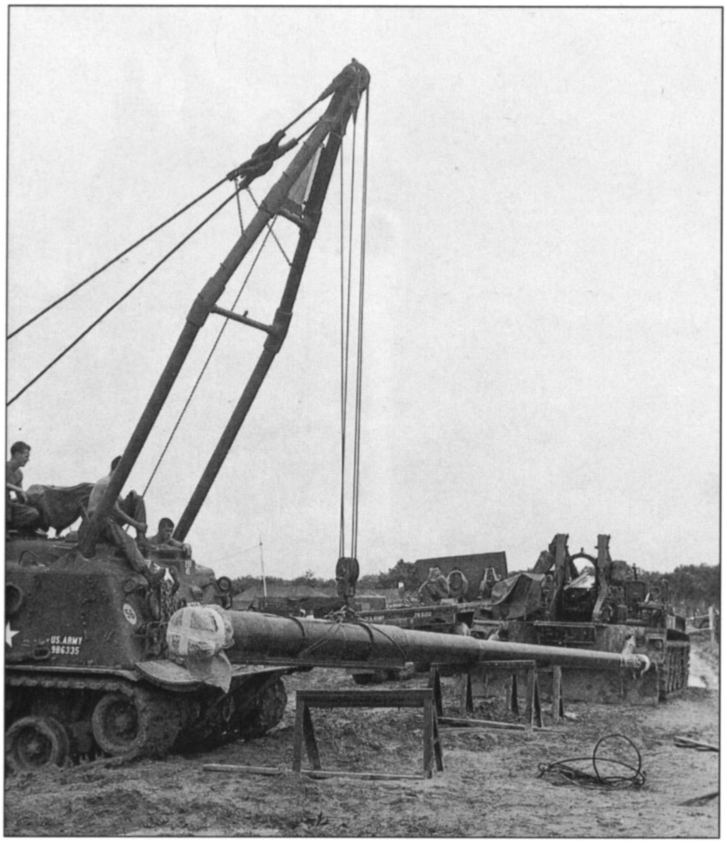
Trying to cross a jungle river in South Vietnam is this U.S. Army M88 armored recovery vehicle. The M88 was first accepted into U.S. Army service in 1959. Over 1,000 M88s were built by the Bowen-McLaughin-York company of Pennsylvania. The production M88 was powered by a Continental AVSI-1790-6A engine with the Allison XT-1400-2 transmission. The vehicle's engine was rated at 980 horsepower at 2800rpm. The M88 was normally armed with a .50 caliber machine gun externally mounted on the vehicle commander's cupola.



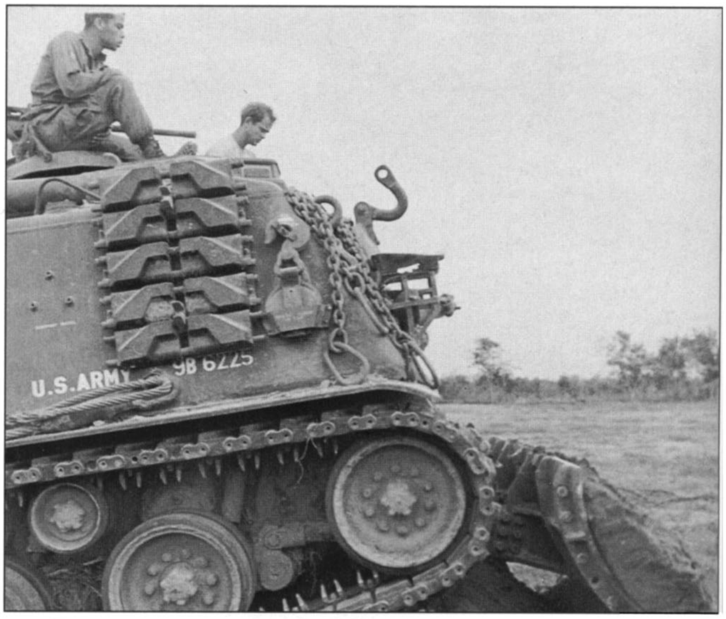
This excellent overhead picture shows the top of M88 superstructure as well as the rear engine deck. This vehicle is an U.S. Army M88 using its front mounted blade to dig defensive positions in South Vietnam in January 1967. The box-like armored shield around the vehicle's commander position is strictly a local modification. Because the M88 was based on the M48A2 tank model it shared a similar gasoline powered engine. This made the M88 in Vietnam a very vulnerable target for enemy antitank weapons like mines and RPGs.



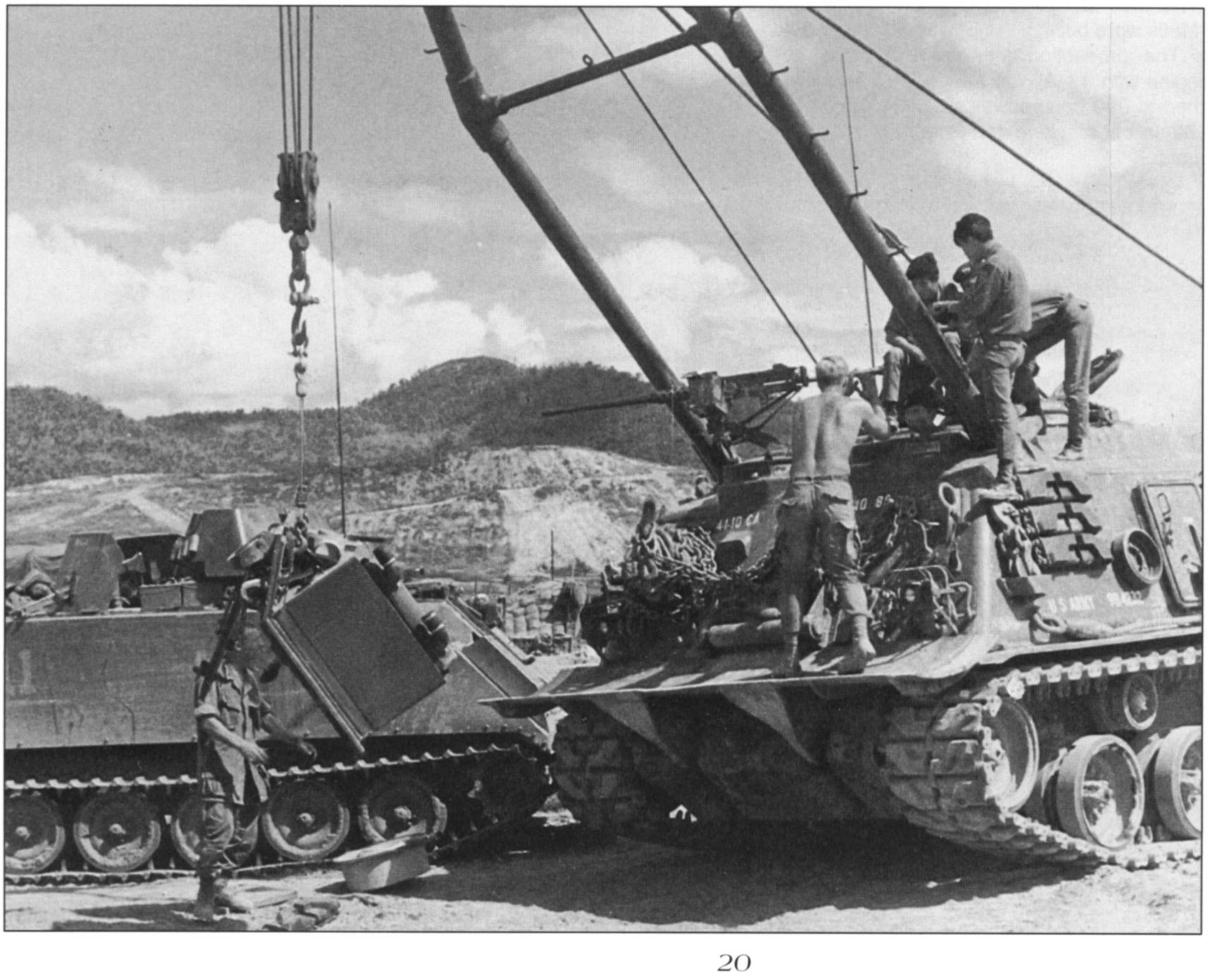
The M88 armored recovery vehicle was based on the suspension and running gear of the M48A2 tank model. It could be used for both medium and heavy recovery operations. The superstructure and crew compartment of the vehicle is composed of a single large armor casting. The armor protection of the vehicle was proof only against some types of machine guns and artillery fragments. The vehicle pictured belonged to Troop B, 10th Cavalry in South Vietnam. Instead of the standard single .50 caliber machine gun, this vehicle sports two.



This M88 is using its hoisting boom to lift a replacement 175mm barrel onto some sawhorses. From there the barrel will be emplaced in the mounted brackets of the M107 self-propelled vehicle in the background. The M88's A frame type boom was attached to the vehicle by a trunnion lever on each side of the cab. The levers extended downward and were connected to the hydraulic boom cylinders which were anchored to the pull in the crew compartment.

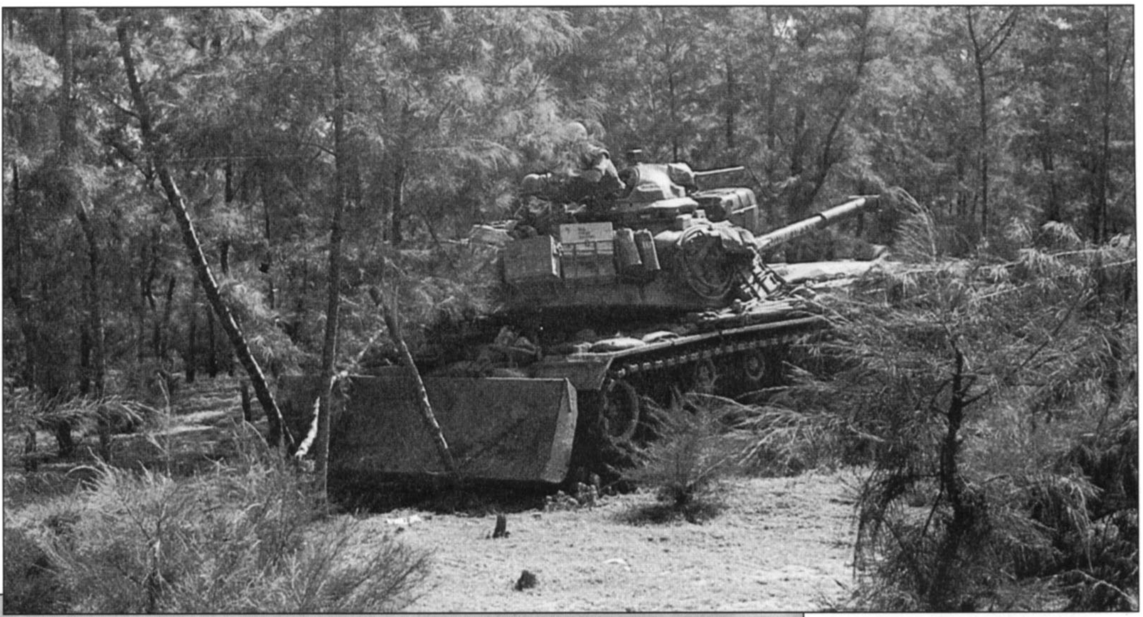


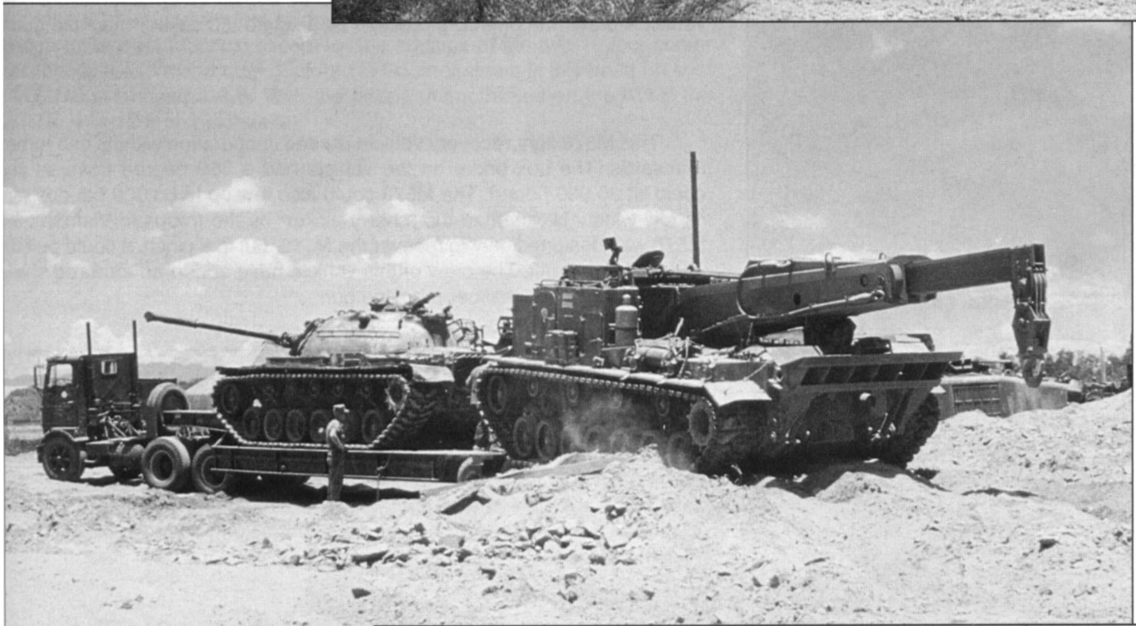
Pictured in South Vietnam is this M88 which is using its front-mounted spade. The spade was both hydraulically powered and controlled and was used to anchor the vehicle or to support it when lifting a load with the boom. It could also be used like a dozer blade for light clearing and leveling. This type of work with the M88 was discouraged as much as possible since the blade could be damaged which would prevent the M88 from completing many of its other more important missions.



Shown in South Vietnam is this M88 which is using its "A" frame type boom to hoist a component of an M113. The four man crew of the M88 was composed of the vehicle commander, driver, mechanic, and rigger. The driver and mechanic were located at the front of the cab with the driver on the left. The vehicle commander was in the center under the cupola just in front of the rigger. Besides the cupola for the vehicle commander, a hatch was provided in the cab roof for each of the other three crew members as well as a door in each side of the vehicle's superstructure.

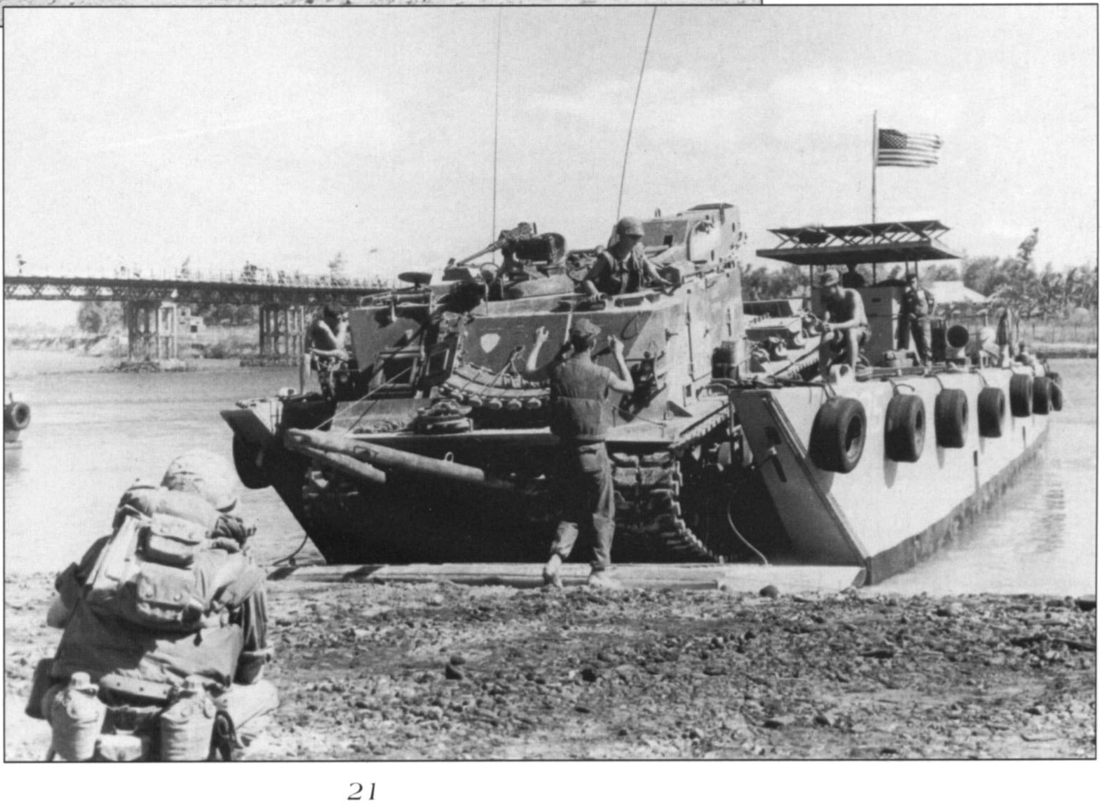
To relieve M88s of the job of being used as a second-rate bulldozer, the U.S. Army and Marine Corps had developed a series of add-on bulldozer blades that could be fitted on the front of their medium tanks. The device attached to M48A3 tanks in South Vietnam was known as the M8A3 bulldozer kit. Patton tanks in South Vietnam that had this kit mounted were use for a wide variety of roles including cutting paths through thick jungle as well as digging out or burying enemy defensive positions.

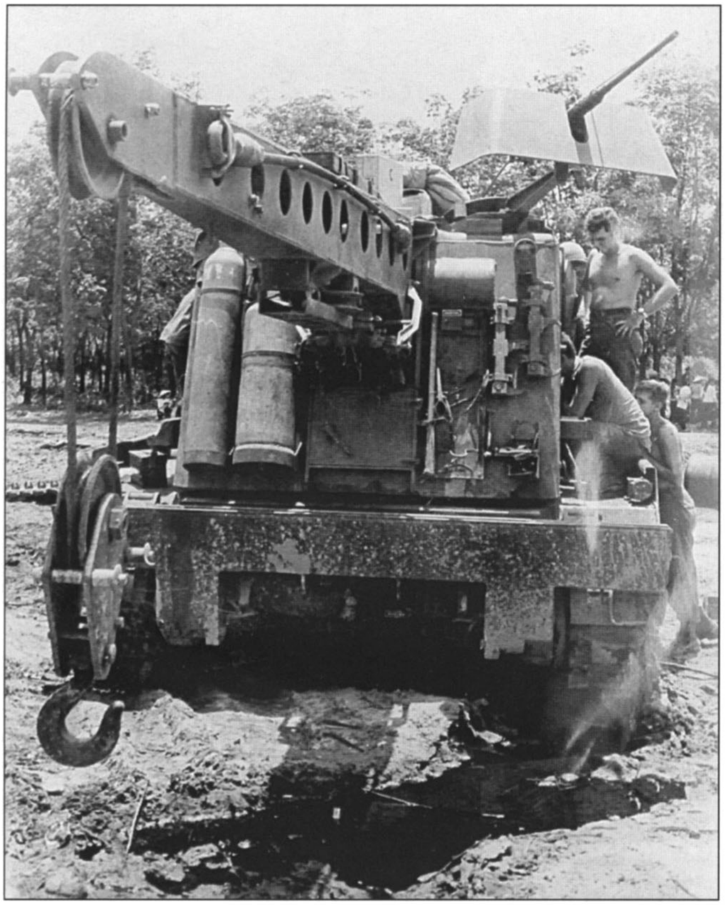


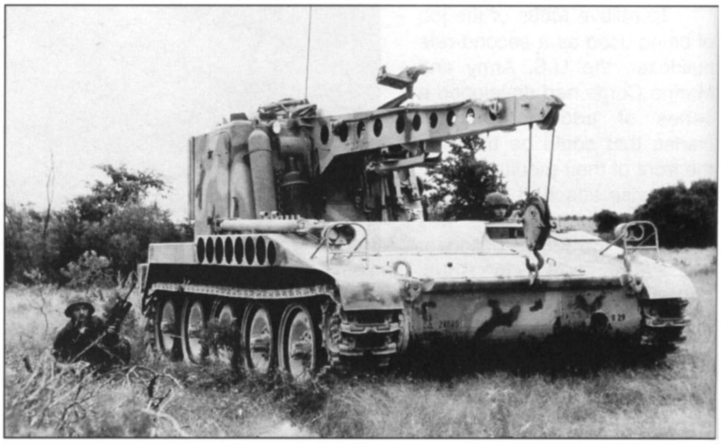


The U.S. Marine Corps didn't have the M88 in service. Instead, they used the massive 60 ton, gasoline-powered, M51 heavy recovery vehicle. The M51 was based on the chassis of the M103 heavy tank. The M51 was nicknamed the "ox" by the troops in Vietnam. Pictured during its test and evaluation period is this side view of an M51. The U.S. Army only used the M51 for a short time before replacing it in service with the M88.

The M51 heavy armored recovery vehicle first entered U.S. Army and Marine Corps service in 1954. The supercharged, fuel injection, air-cooled, gasoline engine that powered the M51 developed about 1000 gross horsepower at 2800rpm. The vehicle was equipped with a 30 ton capacity crane, a 45 ton capacity winch, and a 5 ton capacity auxiliary winch for use in recovery operations. This is an M51 of the 3rd Marine Tank Battalion being unloaded from a naval landing craft at Dong Ha, South Vietnam in June 1967. The hull of the M51 was built of welded rolled armor plate and was divided into three compartments. The cab on the front of the vehicle housed the four man crew consisted of the vehicle commander, driver, crane operator, and rigger. The same compartment also contained the main winch, auxiliary winch, front fuel tank, fixed fire extinguisher cylinder, and auxiliary hydraulic pump.

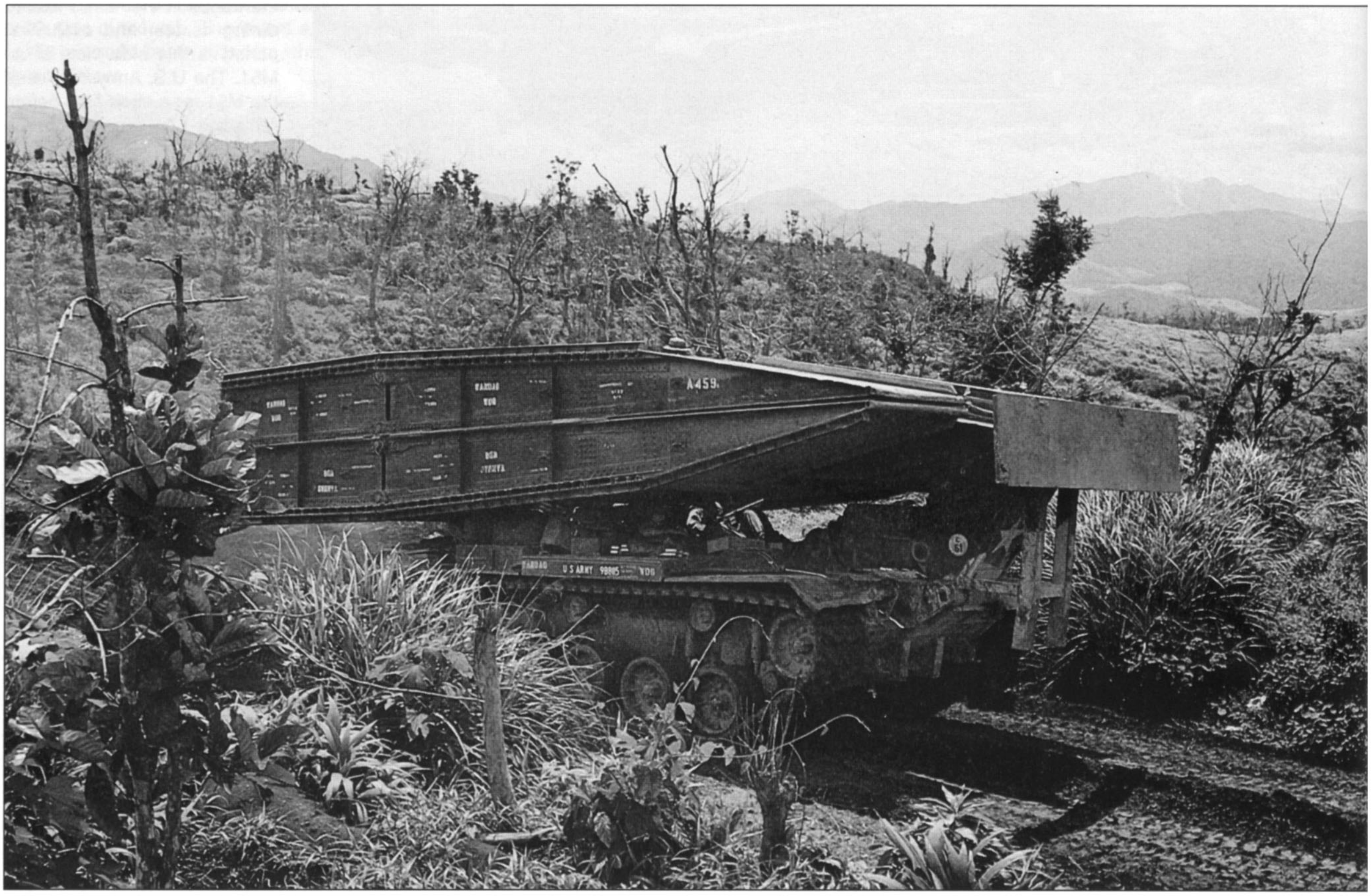




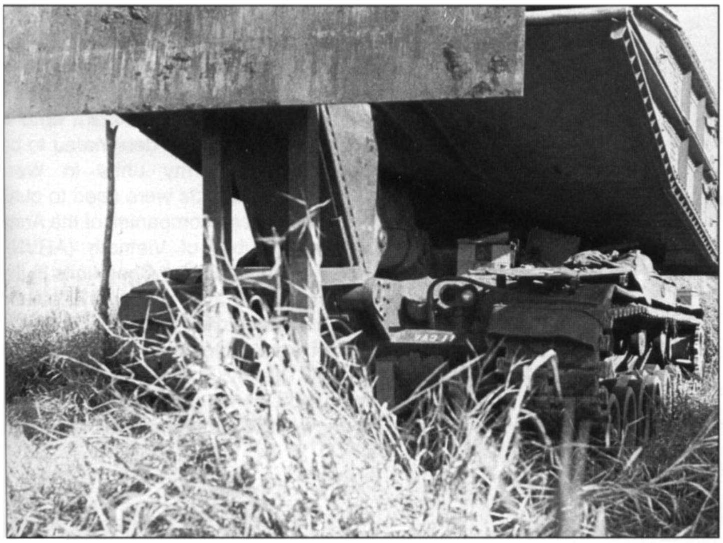


Also employed in South Vietnam was the M578 light recovery vehicle based on the chassis of the M107 and M110 self-propelled artillery carriers. The vehicle was manned by a crew of three consisting of a driver, a crane operator, and a rigger. The front of the vehicle's hull and the driver's compartment was lightly armored. The cab of the vehicle, where the crane operator and rigger rode, was protected by a 1/2 inch of steel armor. The vehicle's crew was offered protection by a single .50 caliber machine gun.

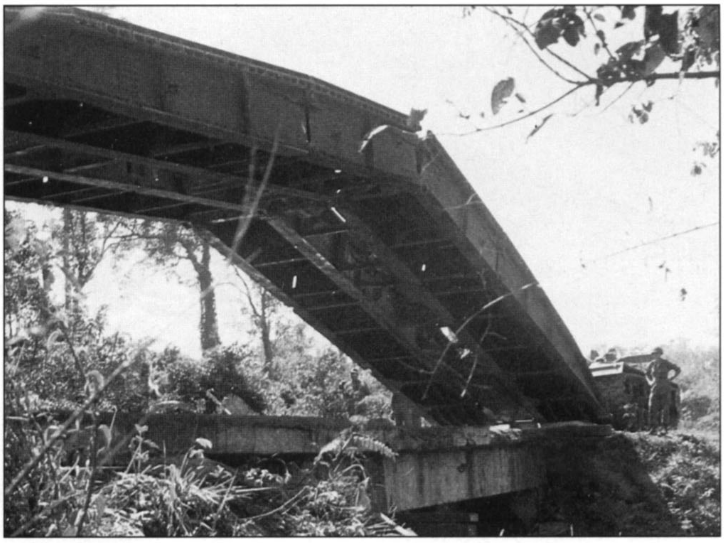
This M578 light recovery vehicle is seen in operation with its cab turned rearwards. The box boom on the vehicle had a 360 degree traverse and could lift 30,000 pound. The M578 could also tow up to 60,000 pounds with its tow winch. Nicknamed the "cherry-picker" by the troops in Vietnam, the M578 was designed only to recover the M113, but in a pinch, it could pull out an M551 light tank. The crew of this vehicle have added an armored shield to their onboard .50 caliber machine gun.



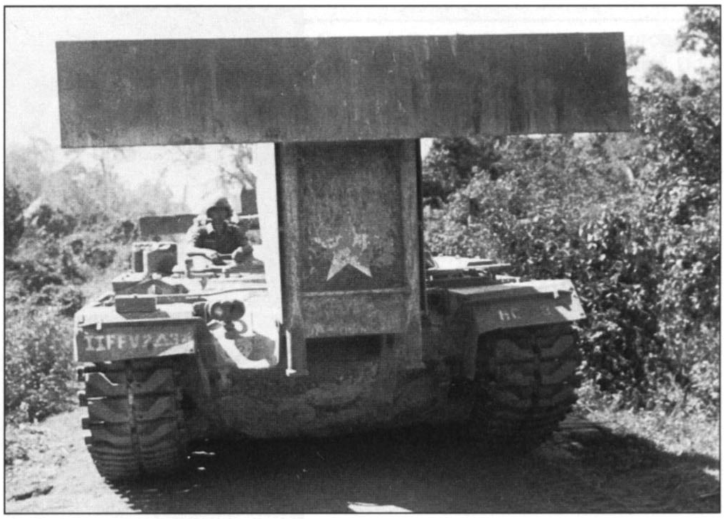
The U.S. Army's M60 main battle tank was never deployed to South Vietnam. However, two variants of the M60 series of tanks were deployed there. One was the Armored Vehicle Launched Bridge (AVLB) based on the chassis of the M60A1 tank. Shown in this picture is the massive bulk of an AVLB traveling down a Vietnamese dirt road.



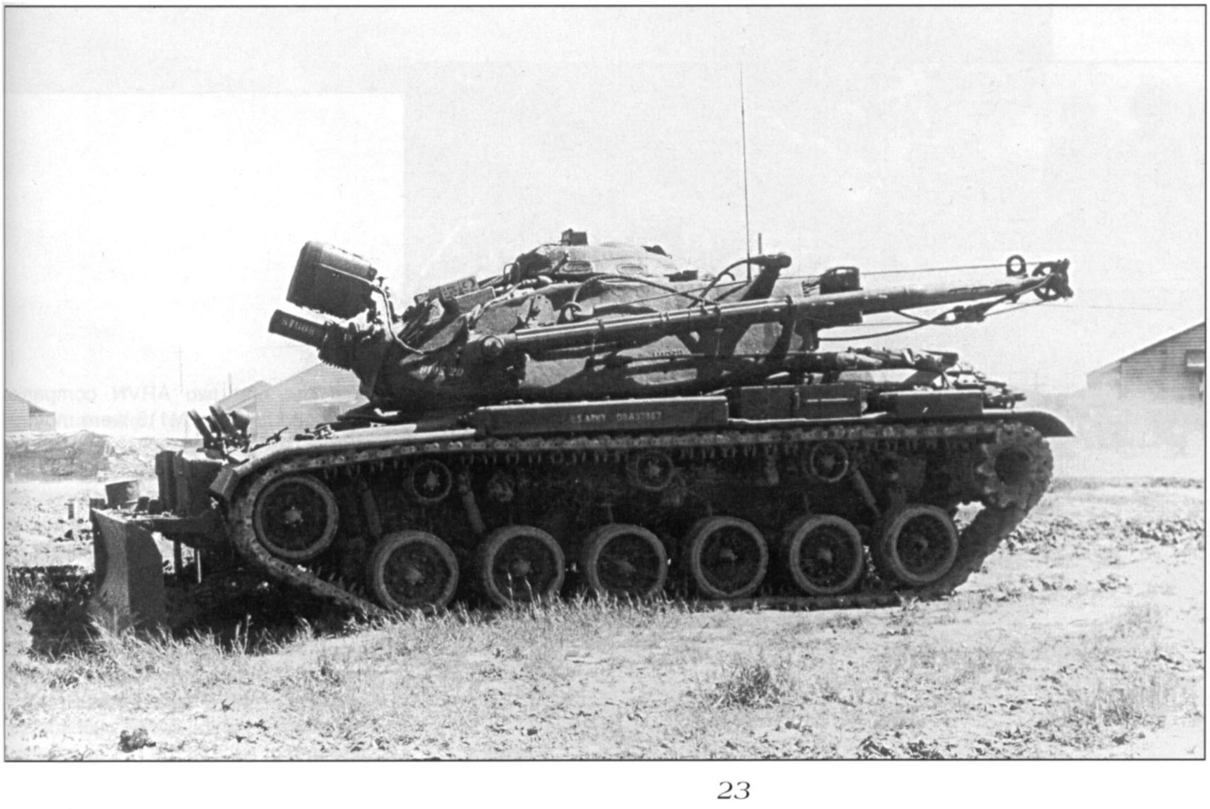
The M60A1 based AVLB could carry either a 40 foot span or a 60 foot span aluminum bridge. Designed to support vehicles as heavy as 60 tons, both the 40 foot and 60 foot bridges had a roadway width of 13 feet. Both bridge units were identical except for the addition of the two 10 foot center sections in the longer model. Pictured in South Vietnam is this head-on shot of an M60A1 based AVLB. With the bridge unit mounted on the AVLB the vehicle was 13 feet 2 inches tall.



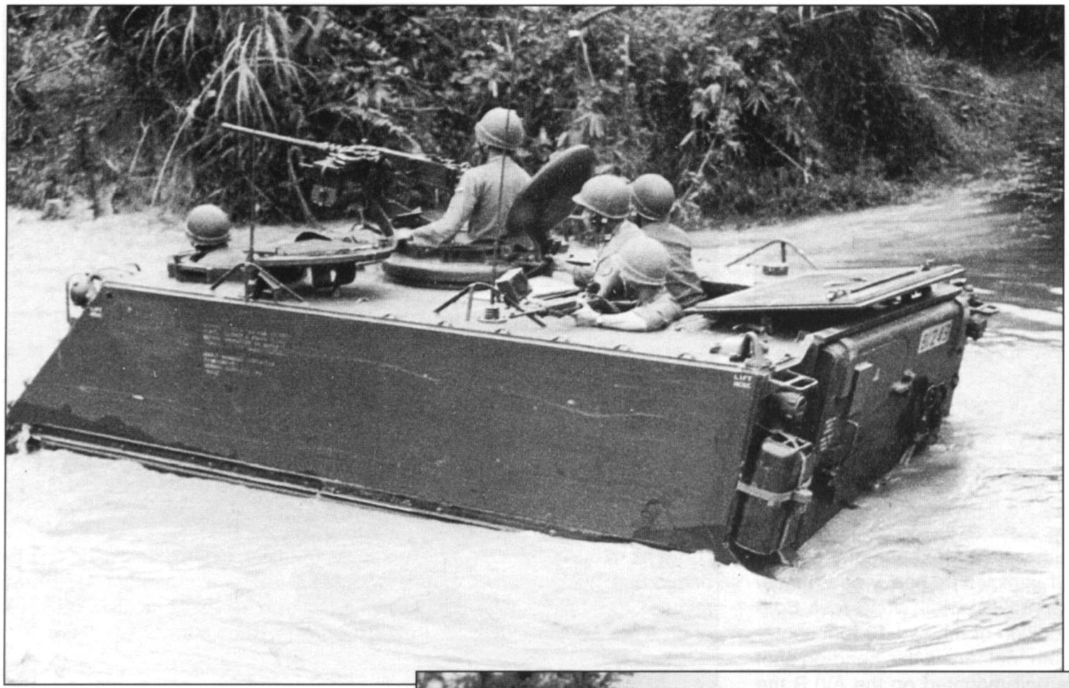
This M60A1 based AVLB is operating in South Vietnam launching its bridge unit. It took the two man crew of the AVLB an average of two to three minutes to emplace their bridging unit. Under the best conditions the crew of an AVLB could recover their bridging unit in 10 minutes.



Minus its bridging unit the M60A1 AVLB was only about 10 feet high. The two man crew of the vehicle was seated side by side below the turret ring with the driver on the left and the commander on the right. The controls for launching and retrieving the bridge were located just in front of the driver's seat.

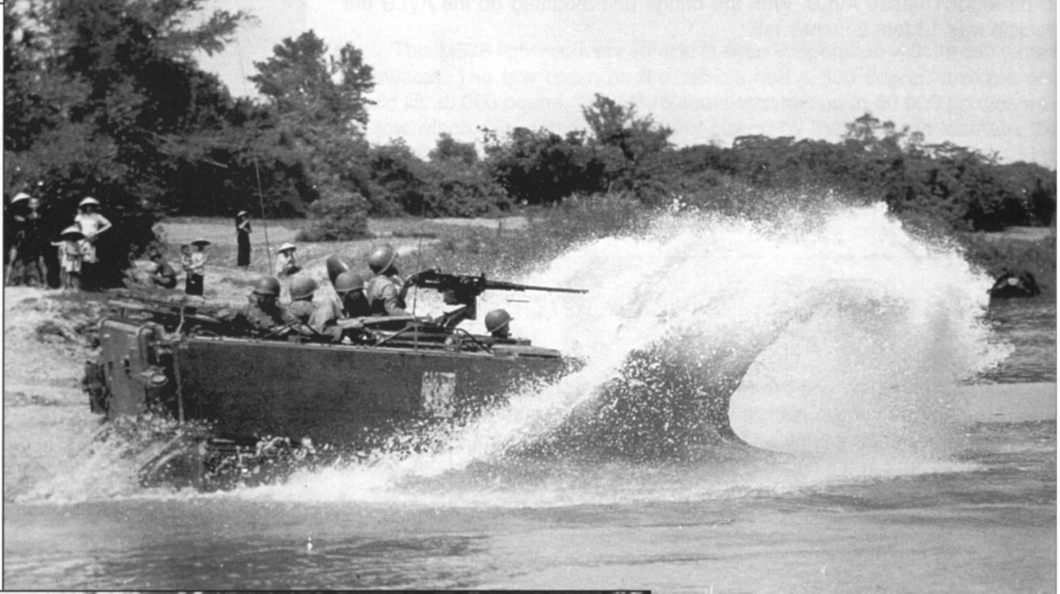


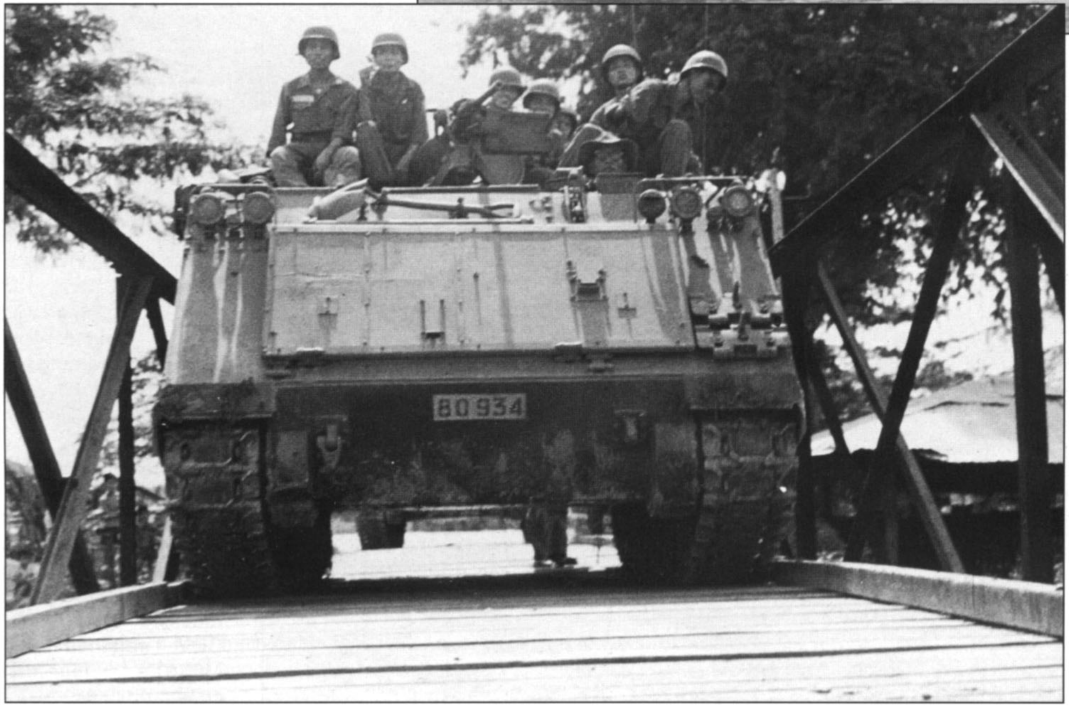
The only other variant of the M60 series of tanks to see service in the Vietnam War was the M728 combat engineer vehicle (CEV). Based on the hull and turret of the M60A1 tank, the CEV was equipped with a large A frame boom and a hydraulically operated winch and dozer blade. Combat loaded the CEV weighted about 57 tons. The CEV was armed with a very short-barreled and short-ranged 165mm howitzer and two machine guns. The CEV retained the M60A1's four-man crew.



The one vehicle that has come to symbolize American involvement in the Vietnam War was the well-known M113 armored personnel carrier. The first M113s to arrive South Vietnam were in early 1962. Originally designated to be sent to U.S. Army units in West Germany, 32 M113s were used to outfit two mechanized companies of the Army of the Republic of Vietnam (ARVN), who were fighting Viet Cong units in the Mekong Delta area of South Vietnam. The first batch of M113s supplied to the ARVN were armed only with an M2 .50 caliber heavy machine-gun on an exposed external pintle mount attached to the vehicle commander's cupola.

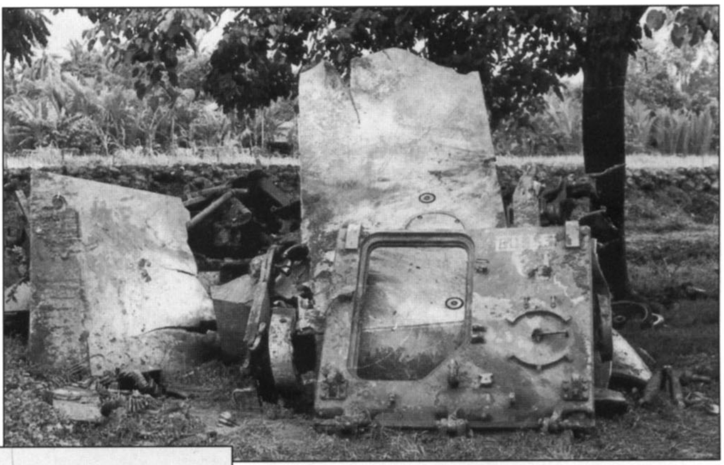
The early model M113s supplied to the ARVN were powered by a 209-horsepower Chrysler industrial gasoline engine and connected to a commercial truck transmission. The power package in these first M113s was an attempt by the U.S. Army and FMC (the civilian builders) to obtain maximum economy in production by using mass-produced components already in use. As a result, the M113 cost about the same as luxury cars of the era. The first ARVN units supplied with M113s were stationed in the Mekong Delta area of Vietnam.

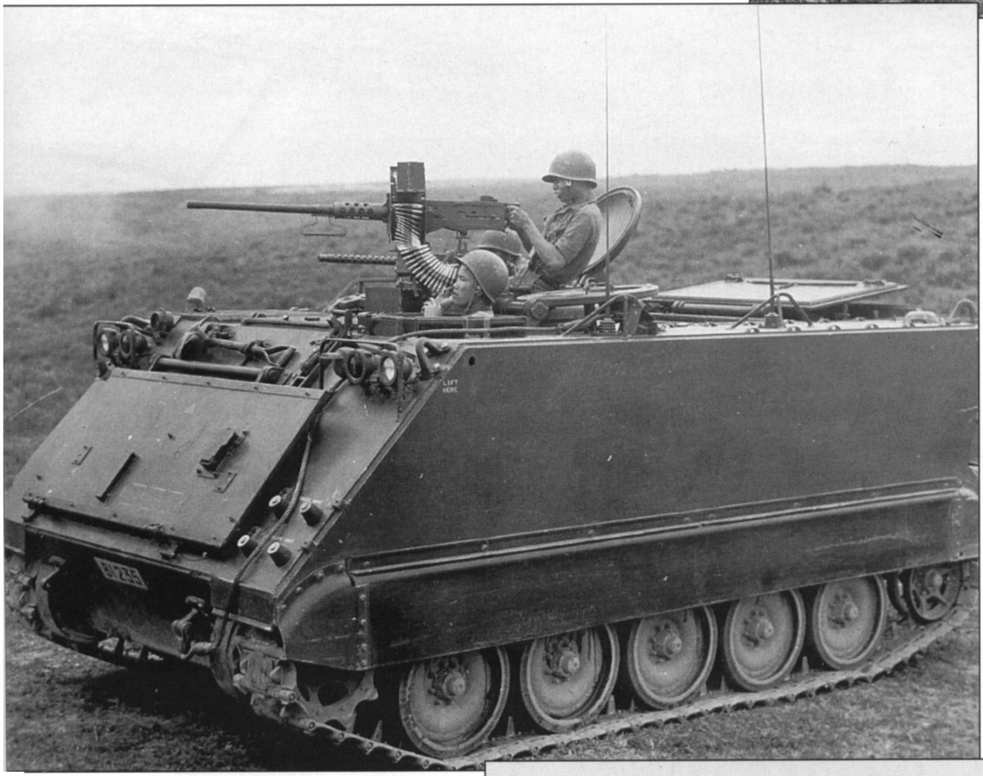




The first two ARVN companies equipped with the M113 were modeled after U.S. Army mechanized rifle companies. Each ARVN company was organized into three rifle platoons with three M113s in each platoon; a support platoon with four M113s, three 60mm mortars, and three 3.5 inch bazookas; and a company headquarters section with two M113s. All of the ARVN M113s were equipped with the standard .50 caliber Browning machine gun. In addition, eighteen .30 caliber Browning machine guns were distributed throughout each of the two companies.

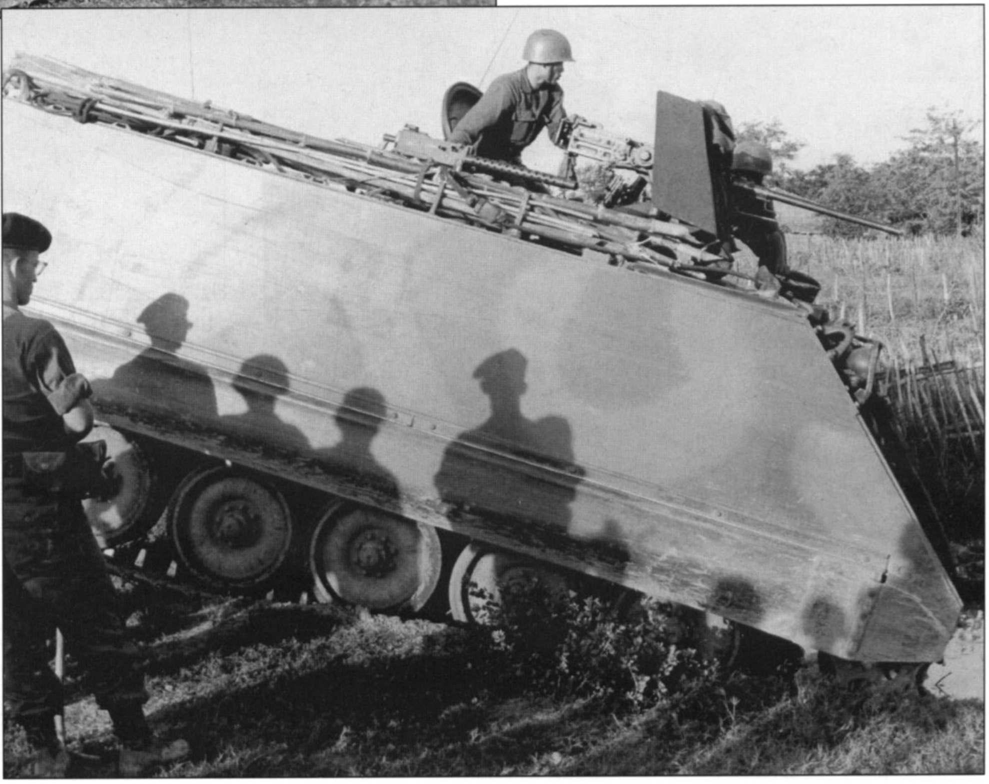
While the ARVN troops found the M113 gave them a great advantage in mobility compared to trucks or leftover armored vehicles from the French Army's time in Vietnam, the vehicle itself was lacking in both firepower and armor protection. Pictured is what is left of an ARVN M113 after running over a large mine.

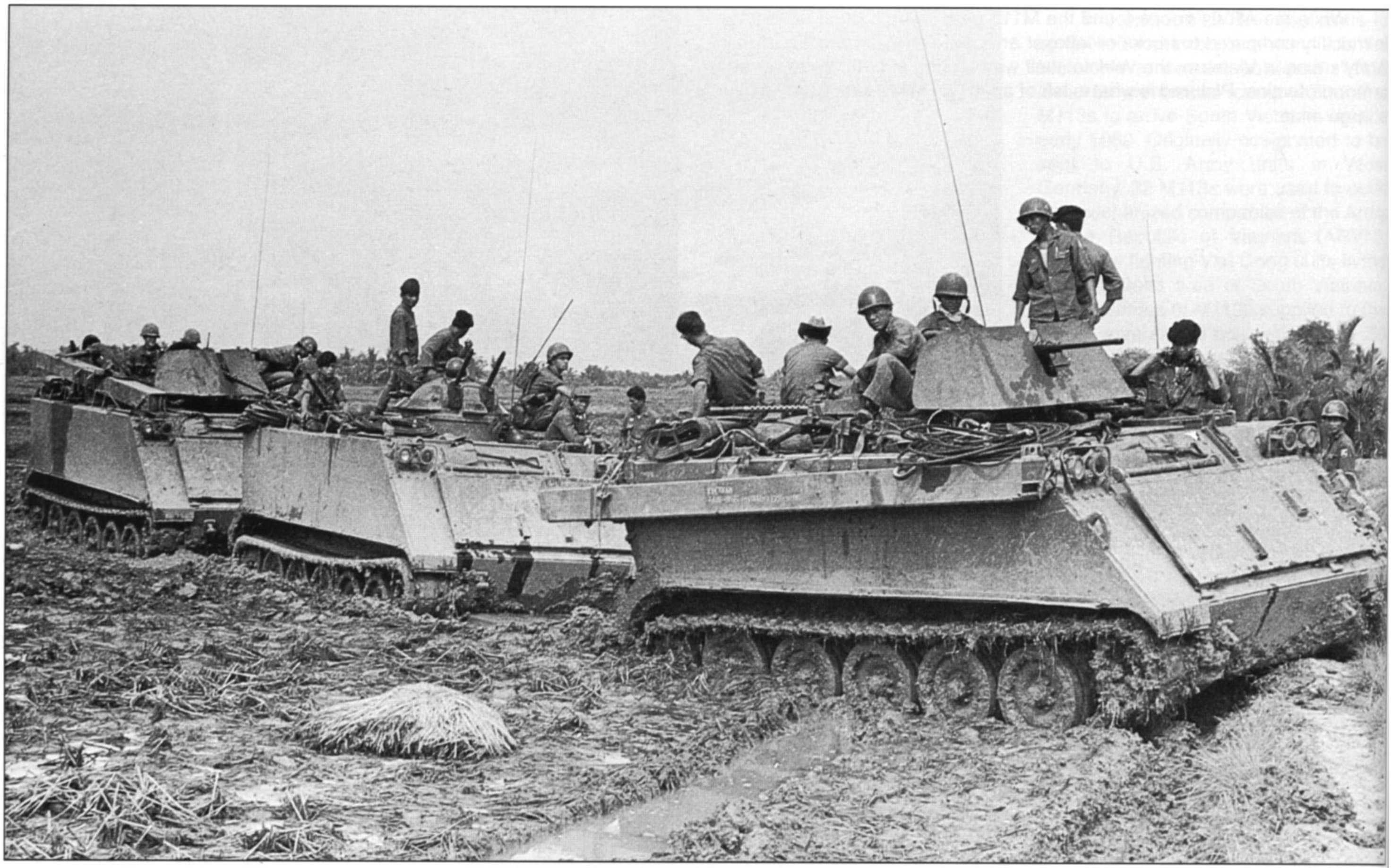




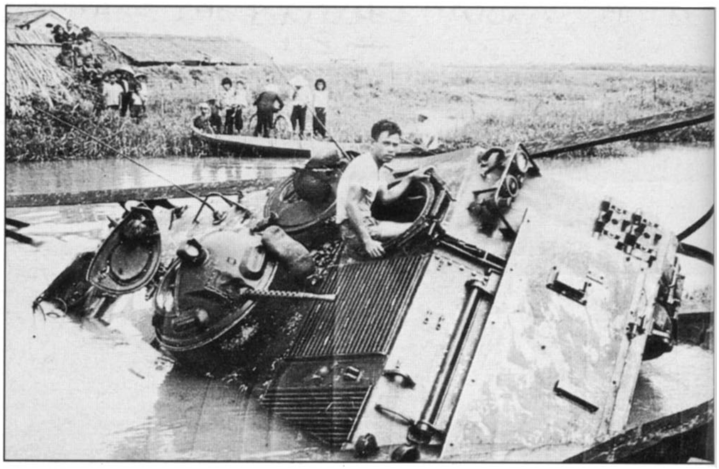
One of the first unforeseen problems encountered by the ARVN soldiers the U.S. Army never counted on was the fact that the typical ARVN soldier could not cock the M2 .50 caliber heavy machine-gun due to his small size. The only way that they could cock the machine-gun was by bracing both their legs against the cupola rim. Unfortunately, this tended to expose their entire body to enemy fire resulting in very heavy losses among the personnel firing the machine-gun in combat.

In an effort to increase the survivability of their M113s in combat, the ARVN (as early as 1963) began fitting armored gun shields to their vehicles in order to protect the person manning the .50 caliber machine gun. There seemed to have been two types produced. One of these gunshield designs is seen in this photo of ARVN M113. The shield itself was fairly small and only protecting the vehicle's .50 caliber gunner from small arms fire coming at him head on. There was no protection from enemy fire from the sides or rear. The small wings of the gun shield did not flair out at all but were bent straight back.

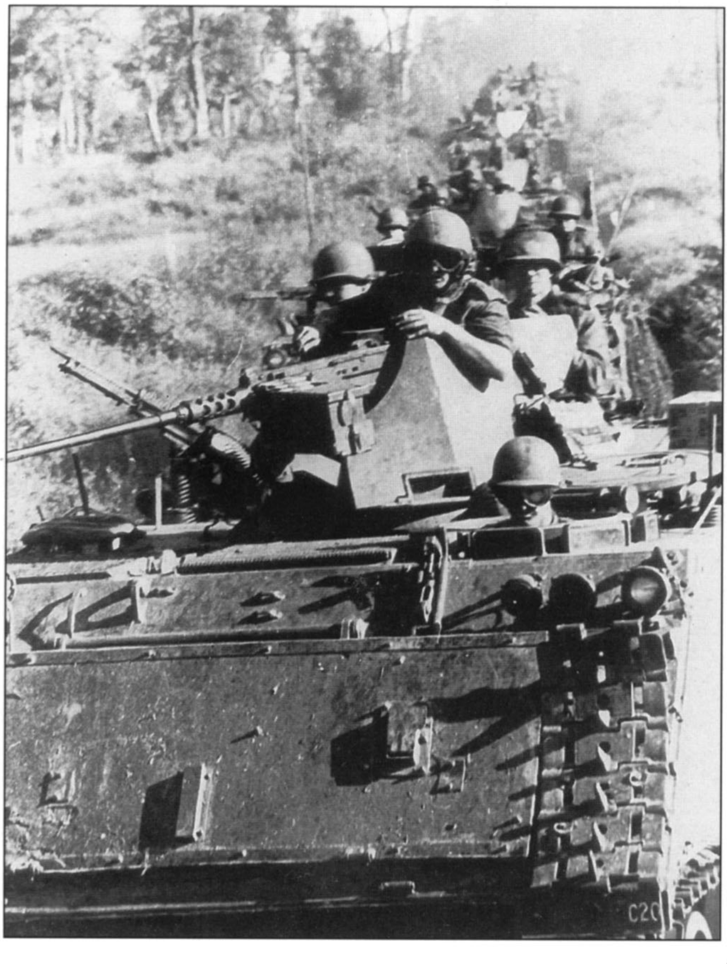




Another gun shield fitted to ARVN M113s is visible on two of the three M113s seen in this picture. The gun shields appear to be a little bit larger than the other design. Also very noticeable is the fact that the wings of the gun shields flair out a great deal more and are not bend straight back as on the other design. Protection from enemy fire from the side and rear was still missing at this point. The ARVN would later develop improved gun shields that would provide all around protection for their M113 gunners.

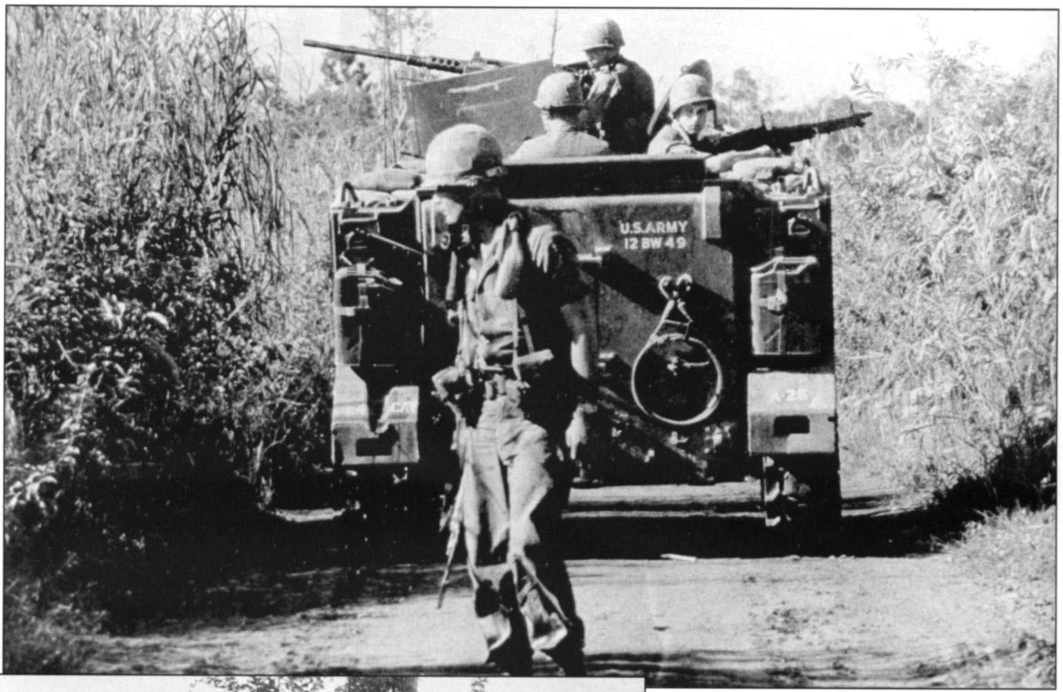


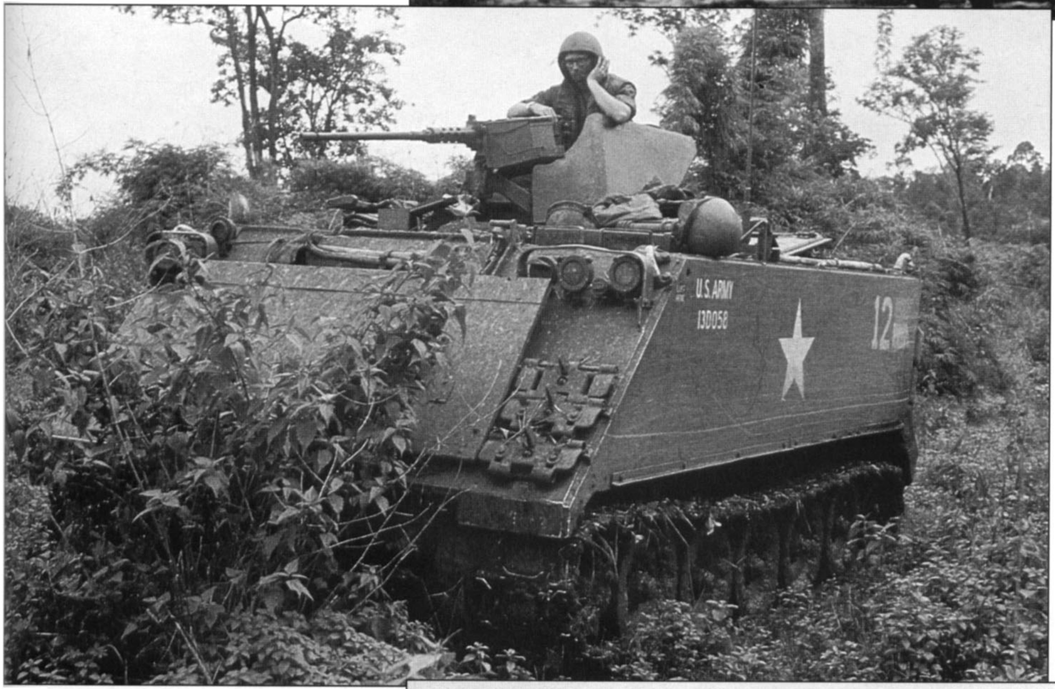
Many ARVN M113s would be fitted with M74 one-man turrets mounting either one or two .30 caliber light machine-guns. The U.S. Army would not mount these turrets on their M113s since they felt that the standard .50 caliber machine gun offered more firepower and punch in combat. Pictured is an ARVN M113 that had a bridge collapse underneath it. Visible is the M74 turret mounting a single .30 caliber machine gun.



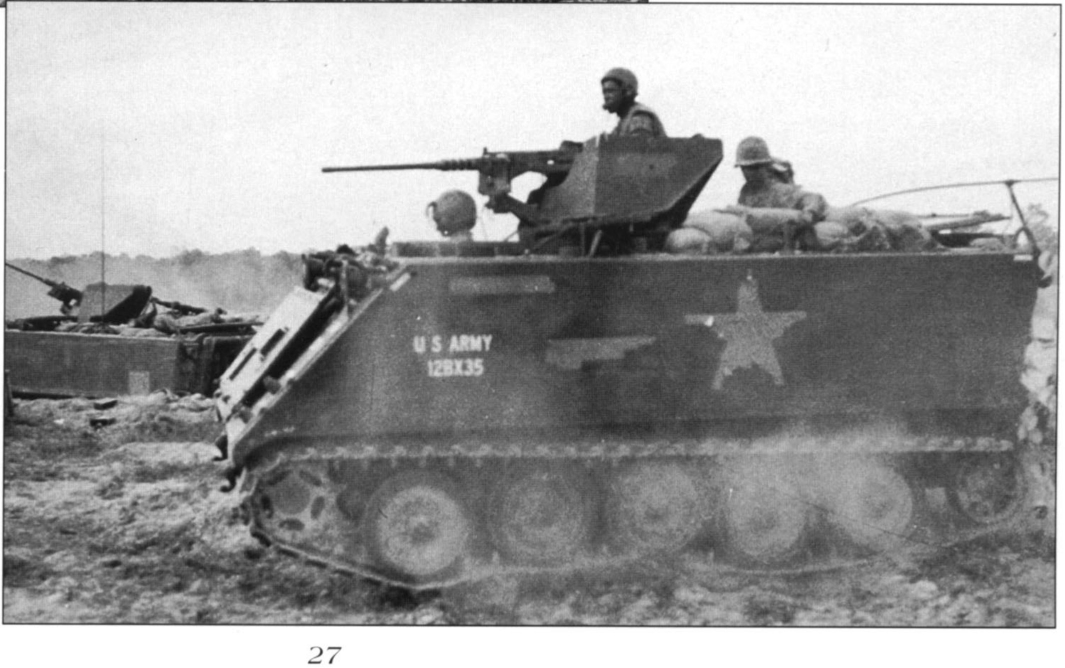
When the first U.S. Army units equipped with M113s appeared in South Vietnam in 1965, they quickly copied the ARVN gun shields by using whatever materials they could get their hands on. This head on picture of an U.S. Army M113 shows one of those early home-made gun shield designed to protect the operator of the vehicle's .50 caliber machine gun. Behind the .50 caliber machine gun barrel can be seen an unprotected M60 machine gun.

This picture shows an M113 of the 1st Infantry Division during an operation 35 miles northwest of Saigon on November 14, 1965. The 50. caliber machine gunner has a homemade gun shield for protection. Notice the M60 machine gunner resting his weapon on a number of sandbags which have been arranged around the edge of the large personnel hatch located over the crew compartment of the M113.

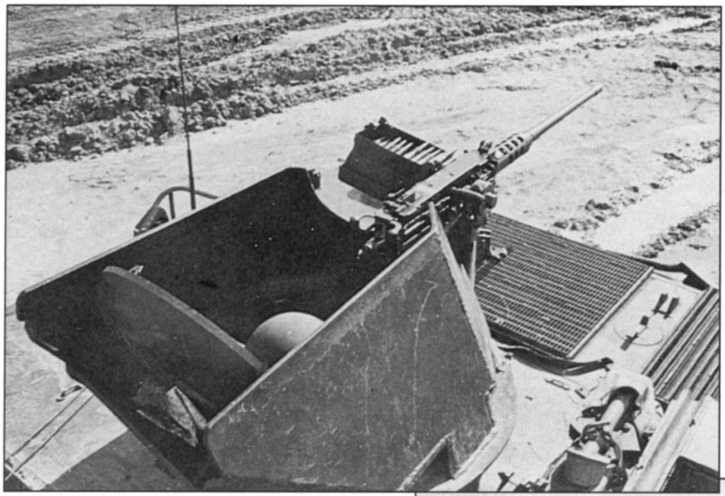




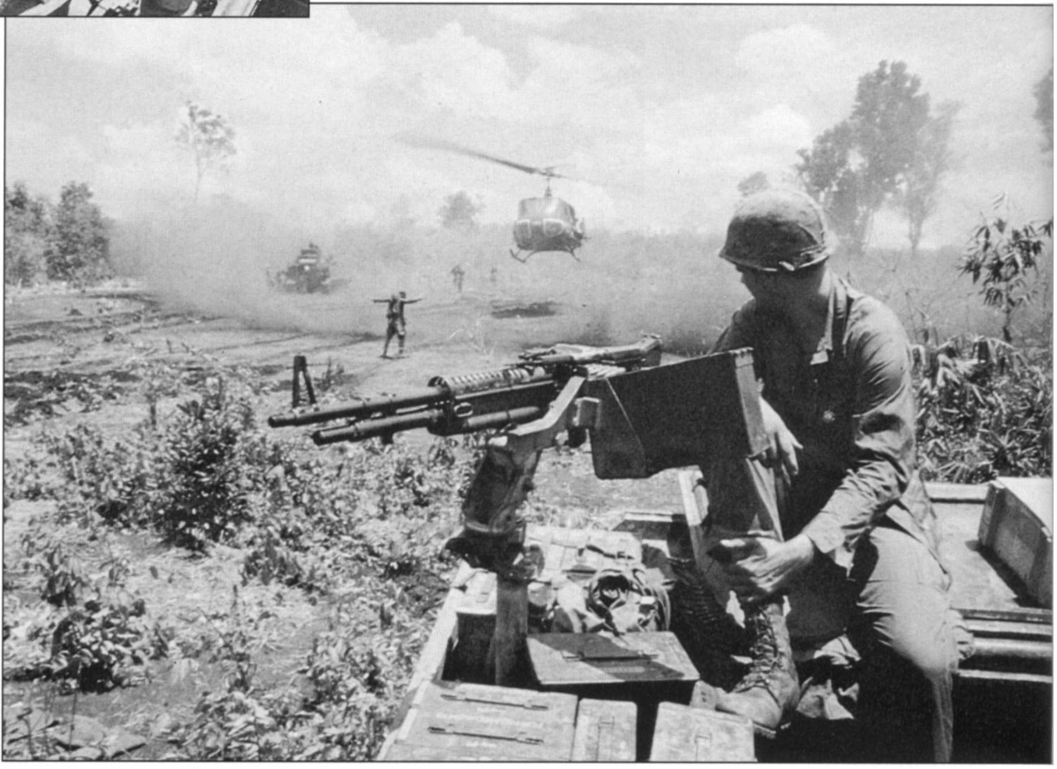
In response to the needs of their M113 equipped units in South Vietnam the U.S. Army quickly designed and mass produced a crude gun shield design of its own. This new gun shield would be manufactured on the island of Okinawa near Japan and shipped to South Vietnam. Sadly at the time, the Army didn't think it needed to provide the personnel in the rear personnel compartment of M113s any form of protection when firing their weapons over the sides of their vehicles.



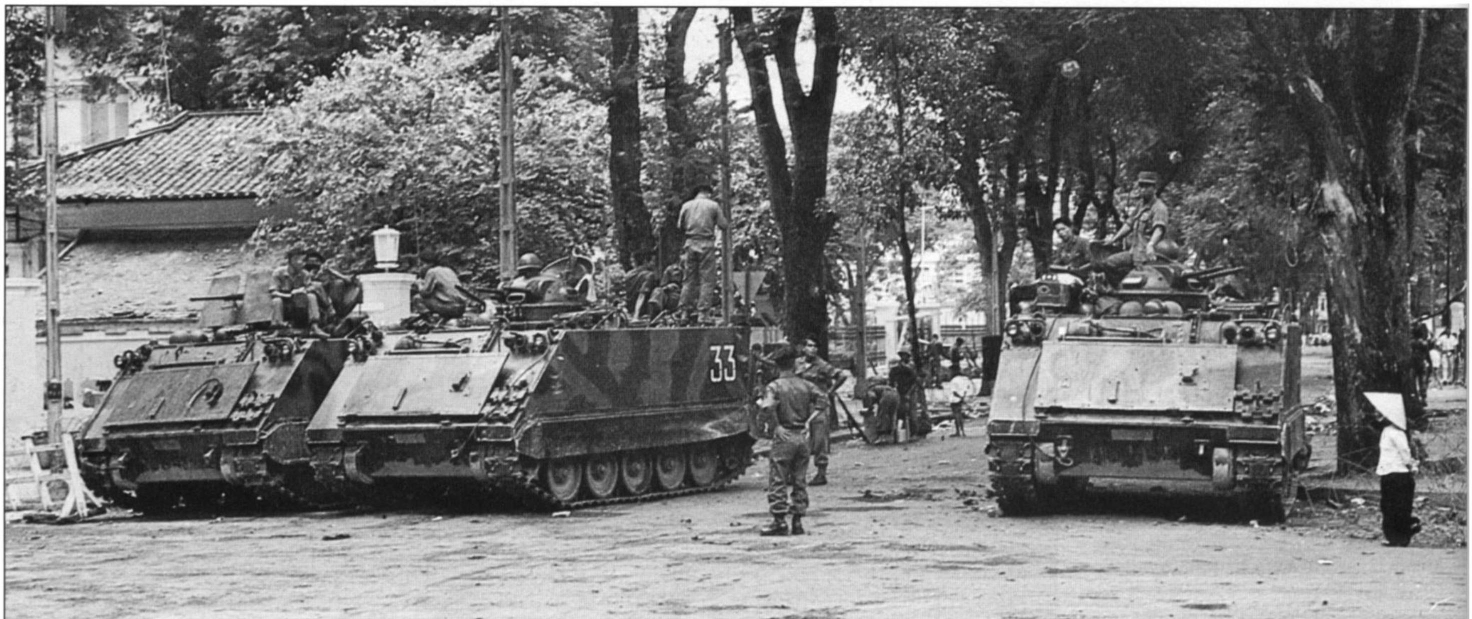
Shown in this picture is an U.S. Army M113 equipped with the new gun shield built on the island of Okinawa. Weighing in at about 12 tons, the gasoline-powered M113s employed in South Vietnam could reach a top road speed on level ground of almost 40 miles per hour. Cross-country speed would depend on the type of terrain the vehicle was crossing.



This is an overhead shot of the new mass-produced gun shield built on the island of Okinawa for the M113s being employed in South Vietnam. Early combat experience by M113 equipped ARVN units showed America's top brass that U.S Army doctrine was unsuitable for use in South Vietnam. When the M113 was originally designed, U.S Army doctrine envisioned that the vehicle was to be used only as a simple armored battle taxi. The M113 was supposed to follow American tanks into battle, and then have their onboard infantry soldiers disembark and attack on foot, an objective that the tank couldn't handle.



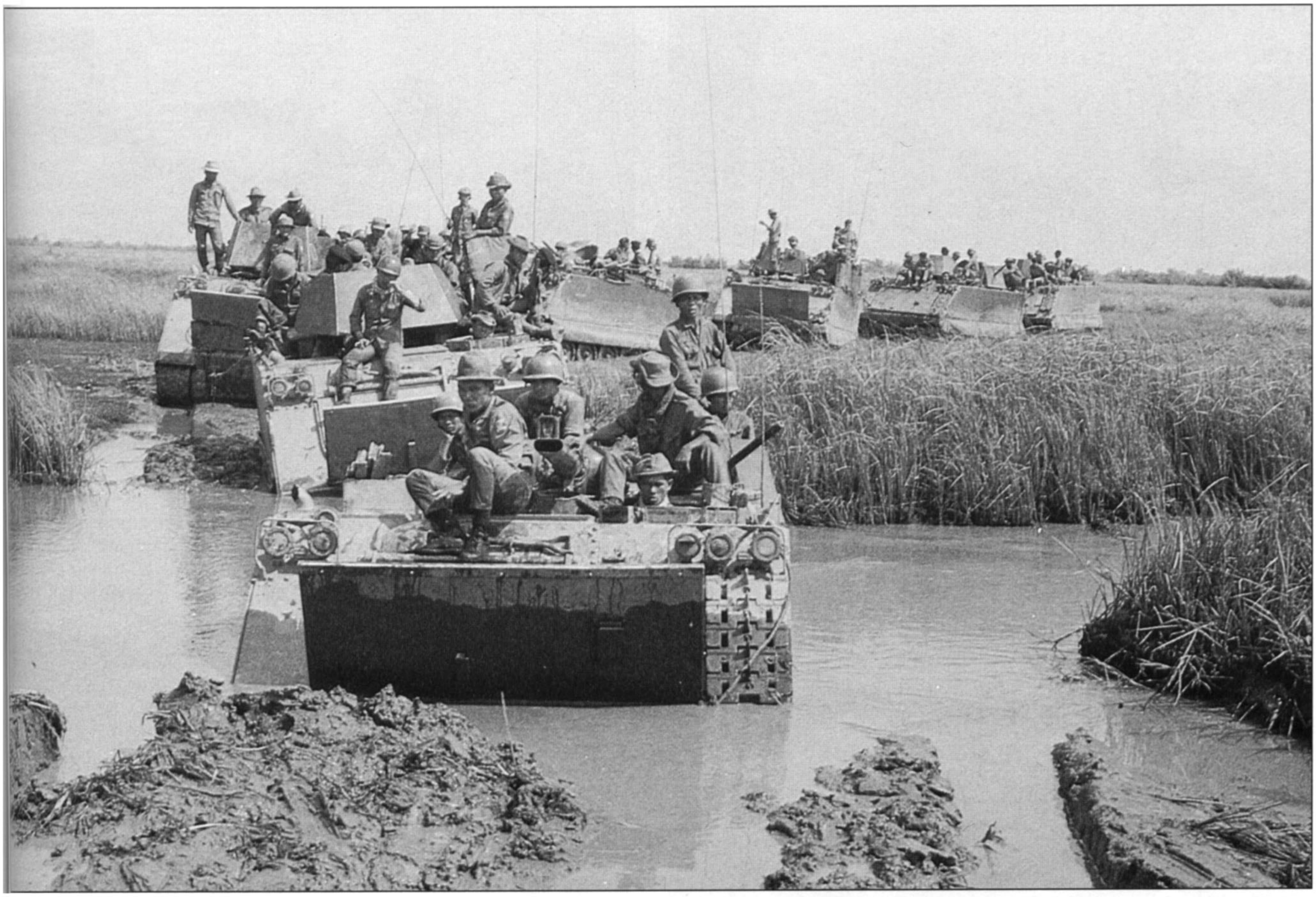
American military advisors to the ARVN quickly figured out that it made much more sense for the infantry soldiers carried onboard M113s to remain in their vehicles when engaging the VC in combat. Using their own weapons the onboard infantry soldiers of M113s could inflict heavy casualties on their opponents. However, once the onboard infantry soldiers left their vehicles they tended to lose both the firepower and mobility advantage they enjoyed over their opponents. This photo shows the mounted bracket for an M60 machine gun on an American M113.



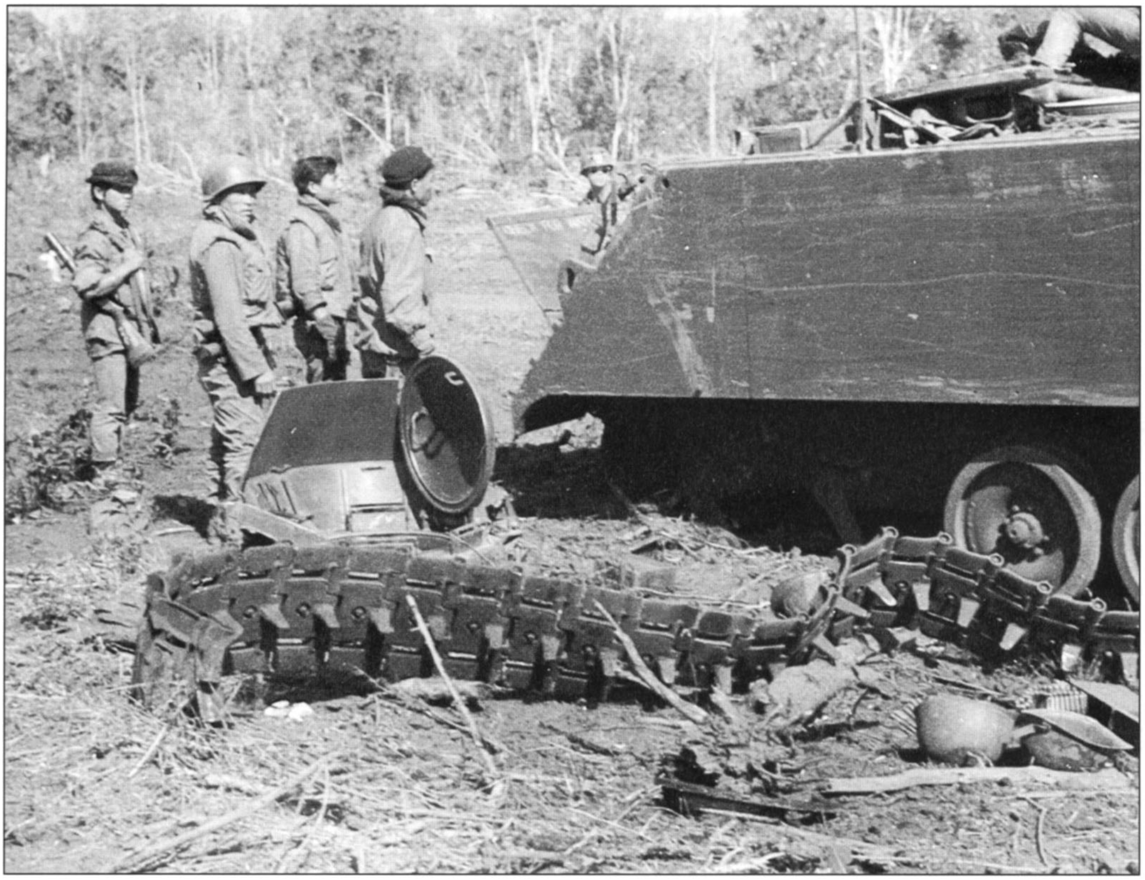
During 1962 the 3.5 inch bazookas and the 60mm mortars were judged unsatisfactory because of their limited range. Each newly organized ARVN mechanized rifle squadron was thus equipped with three 81mm mortars and a 57mm recoilless rifle. Three ARVN M113s are stationed somewhere in Saigon in November 1963 in which two of them are still fitted with M74 turrets mounting twin .30 caliber machine guns.

American military advisers to the ARVN were impressed by the maintenance of weapons and equipment. The typical Vietnamese armor crewman was outstanding in his innovations which often extended to making repairs to his equipment with chewing gun, bailing wire, and even banana stalks. Pictured is a group of happy ARVN soldiers posing on top of one of their M113s. Like so many ARVN M113s this vehicle is equipped with an M74 machine gun turret.

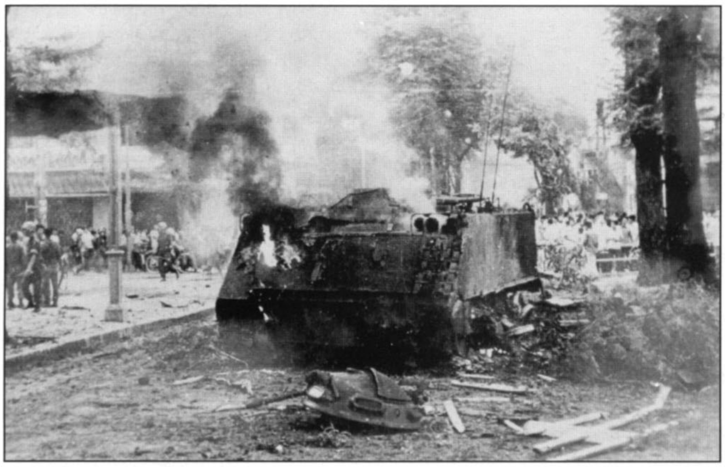
This ARVN M113 has Viet Cong suspects placed on the vehicle's trim vane. With the help of American military advisors the ARVN units equipped with M113s began improved their combat skills. One tactic practiced by the ARVN in confronting a night attack was to wait until the enemy troops were in the open before turning on their headlights and driving straight at the enemy attackers. With the supporting fire of dismounted infantry and mortars this tactic usually disrupted any VC or NVA attack.



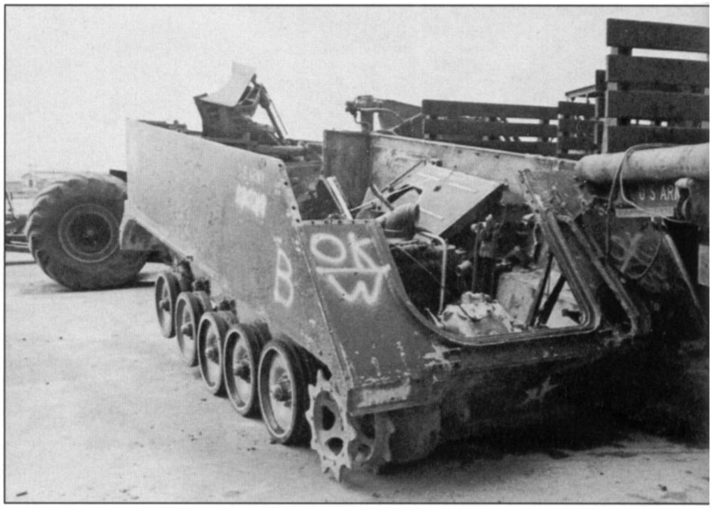
A formation of ARVN M113s is operating in the Mekong Delta. The Viet Cong who first faced the U.S. Army supplied M113s nicknamed them the "Green Dragons" because of their appearance as they moved cross-country across the rice fields spitting fire and smoke from their guns and engines reminded them of fairy tale dragons of ancient lore.



The VC and NVA soon got over the shock of engaging in combat with M113 units. They quickly adapted their tactics to deal with the vehicle. The VC and NVA soon began laying more antitank mines in areas traveled by ARVN armored formations. Pictured is an ARVN M113 which has not only lost its track and suspension system to an enemy mine but also the commander's cupola and part of a gun shield shown lying on the ground next to the vehicle.



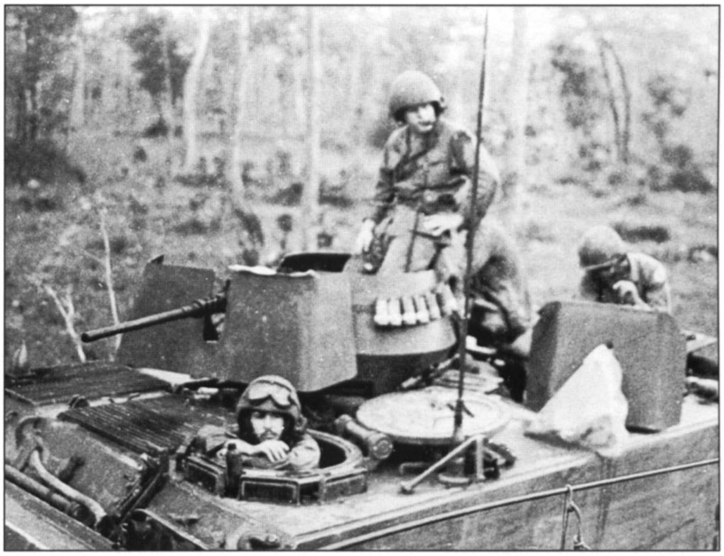
VC and NVA combat units were also issued with a variety of Soviet-built recoilless rifles and rocket-propelled grenades (RPG). This picture shows what happened to an ARVN M113 after being hit by an enemy RPG during fighting in a South Vietnamese city. The vehicle's M74 machine gun turret is laying on the street in front of the vehicle.



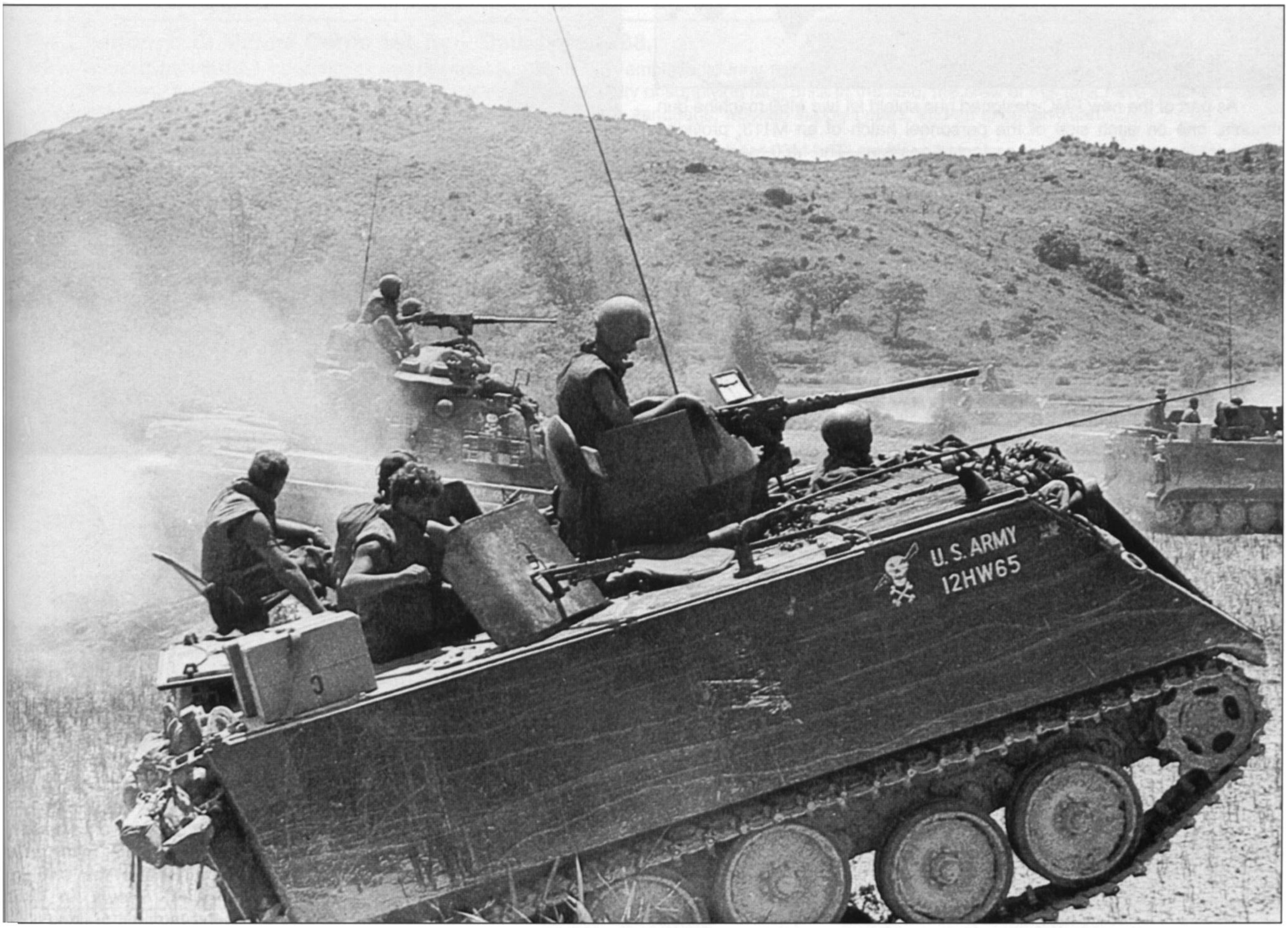
The box-like aluminum armor hull of the M113 offered protection only from small arms fire and some artillery and mortar fragments. Heavy machine gun fire could easily pierce the 35mm thick armored hull. Even an enemy soldier firing an AK-47 with armor-piercing ammunition at close range could penetrate the armor of the M113. Most feared by the crews of M113s were rocket-propelled grenades (RPG). This is what is left of an M113 after seeing heavy combat in Vietnam.

Despite the reorganization and new equipment supplied to the ARVN mechanized units in the early 1960s, there was always the problem of poor leadership and lack of proper training which would plague the ARVN till the very end of the Vietnam War. Despite their firepower superiority, provided by vehicles like the M113, ARVN armored units were constantly being ambushed by the VC and NVA with resulting high losses in both men and equipment. Pictured is an ARVN M113 being towed out of flooded rice paddy.

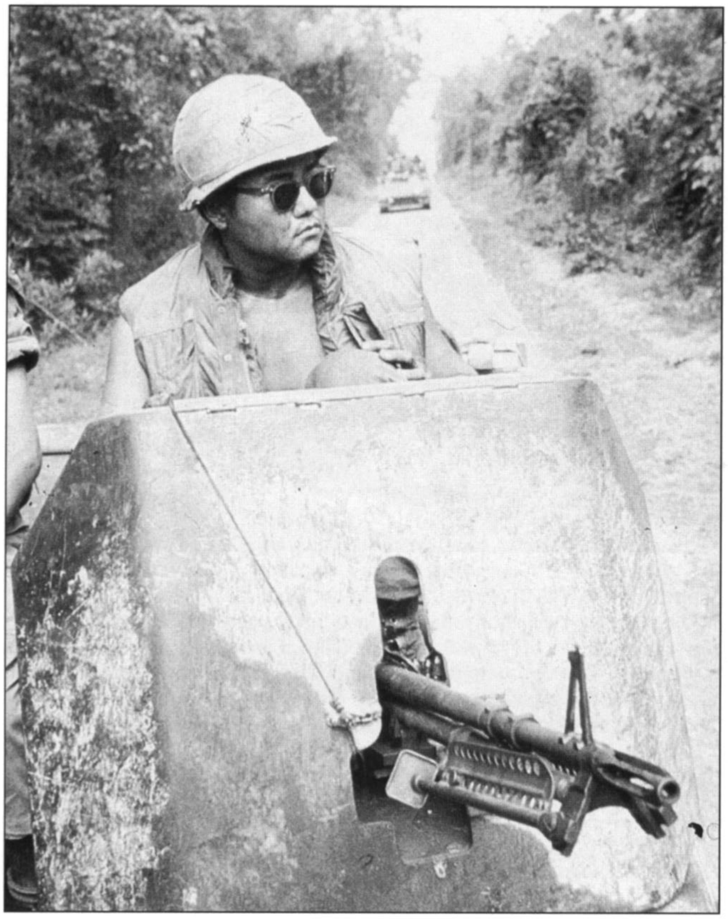
In South Vietnam most armored crewmen, be they ARVN or American, did everything they could to reduce mine injury to themselves and damage to their vehicles. The floors of many M113s were overlaid with sandbags, rations and ammunition boxes, or unused flak jackets to prevent mine blast. However, the problem with the hull floors of M113s covered with objects heavy enough to absorb a mine blast was the fact that the vehicle wasn't designed to operate with all that extra weight. In one U.S Army unit newly arrived in Vietnam, the soldiers placed two layers of sandbags in all their M113s, plus all the other equipment, troops, and ammunition. Within forty-five days, they broke fourteen transmissions from overloading. Most units equipped with M113s tended to use two layers of ammunition boxes on the hull floors of their M113 to absorb a mine blast.



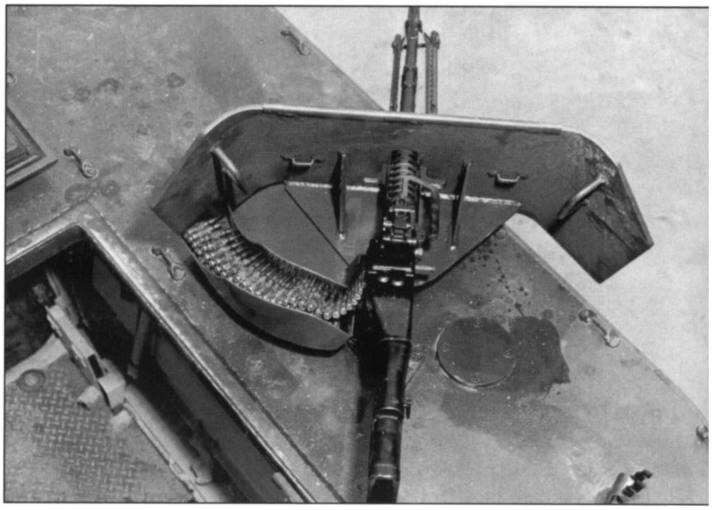
When the 11th Armored Cavalry Regiment was deployed to South Vietnam in 1966, their M113s had been equipped with a new FMC-designed and built gun shield kit. It was composed of an open-topped turret fitted to the commander's hatch with two additional side machine gun mounts adjacent to the troop hatch at the rear of the vehicle. The front shield was mounted on the machine gun pintle to maintain flexibility of weapon mount and permit servicing weapon with minimum exposure of personnel.



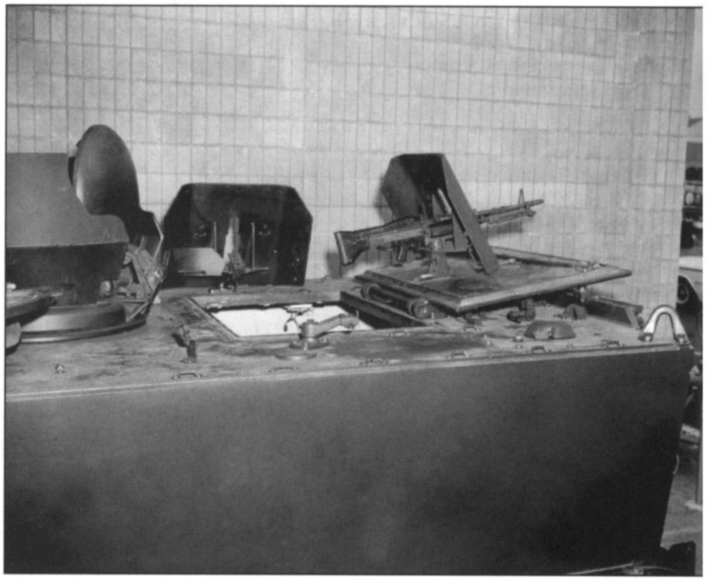
On the new FMC-designed gun shield kits for the M113 the vehicle commander's cupola hatch cover formed the rear of the gun shield when placed in an upright position. Notice that the vehicle commander is bracing himself against the open rear hatch of his cupola. Also visible in this picture is the fact that the vehicle commander has wedged a piece of wood in between his cupola hatch and the outer armor portion of the main gun shield. This might have been done to prevent the cupola hatch from slamming down on the vehicle commander if the latches on the cupola hatch broke for some reason.



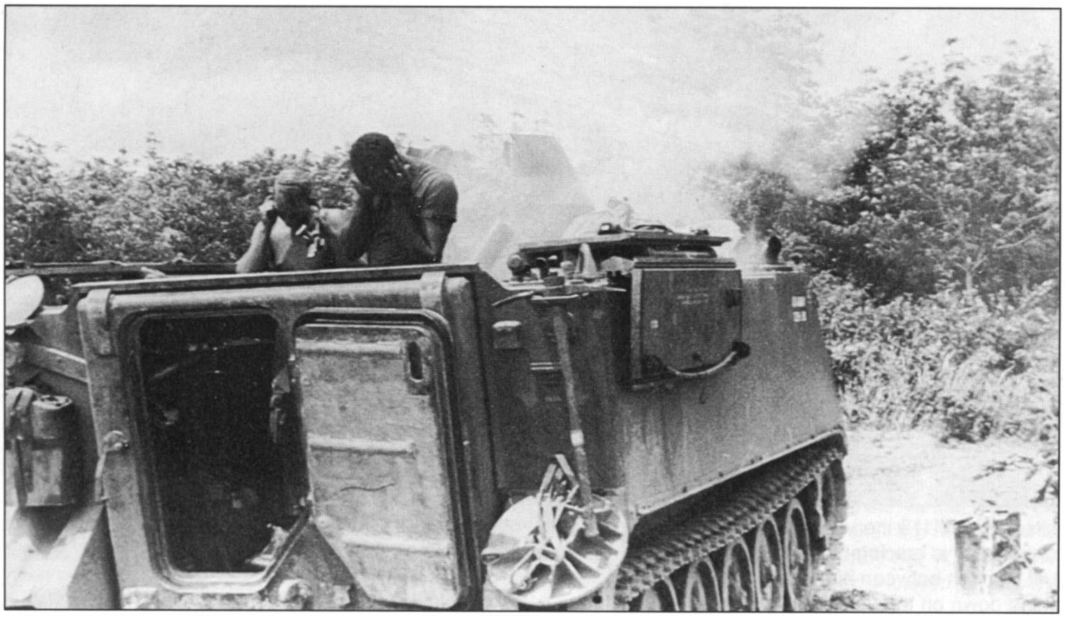
As part of the new FMC-designed gun shield kit two M60 machine gun mounts, one on each side of the personnel hatch of an M113, provided additional firepower from armor protected positions, The M60 machine gun weights 23 pounds and has a cyclic rate of fire of 500 to 600 rounds per minute. The effective range of the M60 machine gun is about 1,000 yards.



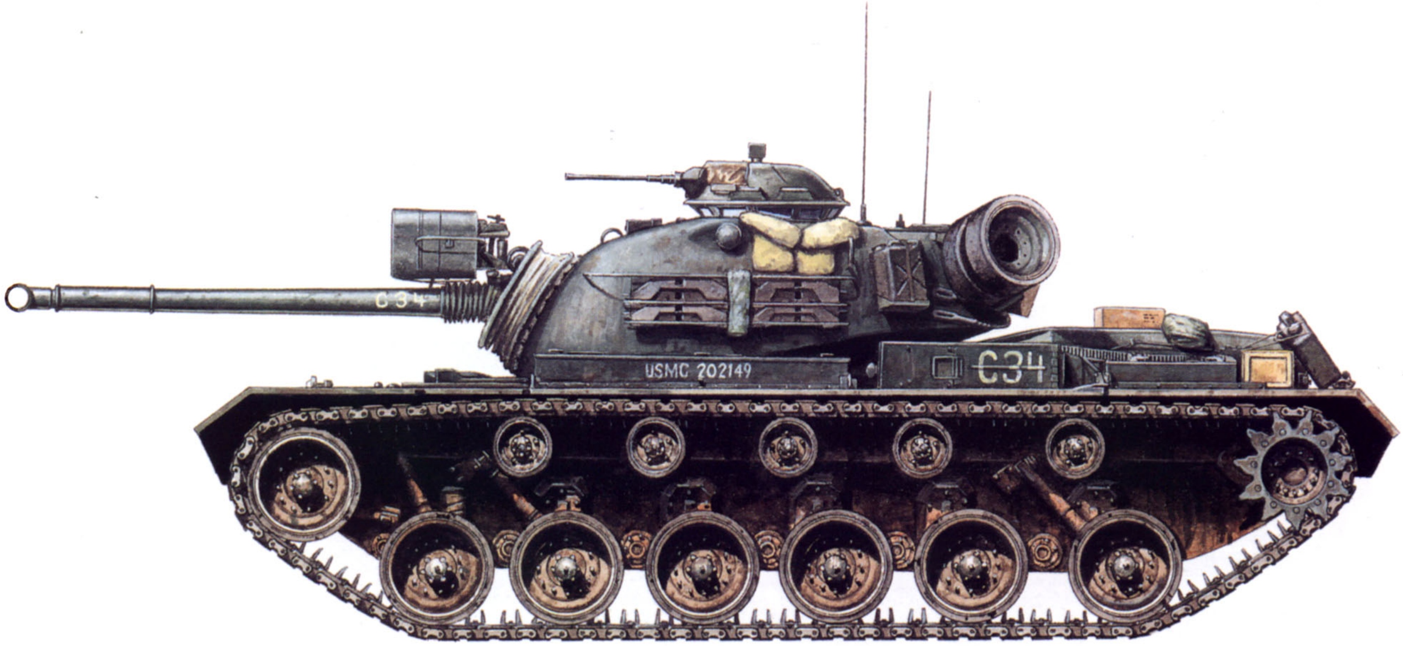
Movable arms with sockets were bolted to the vehicle top plate of a M113 adjacent to the personnel hatch. The gun shields had the standard machine gun mount to take the M60 machine gun. The M60 machine guns (with or without a bipod) could be easily and quickly installed. Travel locks were provided so the weapons could remain installed ready for use during transit. The shields incorporated a tray for belted ammunition. Rotating arms provided a full field of fire and minimum depression angle for close-i support.



As part of the FMC-designed gun shield kit mounted on Vietnam-bound M113s, there was a removable socket which could be installed on the personnel hatch cover so that an M60 machine gun and armored shield could be mounted for firing to the rear of the vehicle. Also visible is the mounted supports for the commander's cupola hatch. Picture evidence seems to indicate that the rear facing machine gun and shield were seldom mounted on M113s during the Vietnam War.

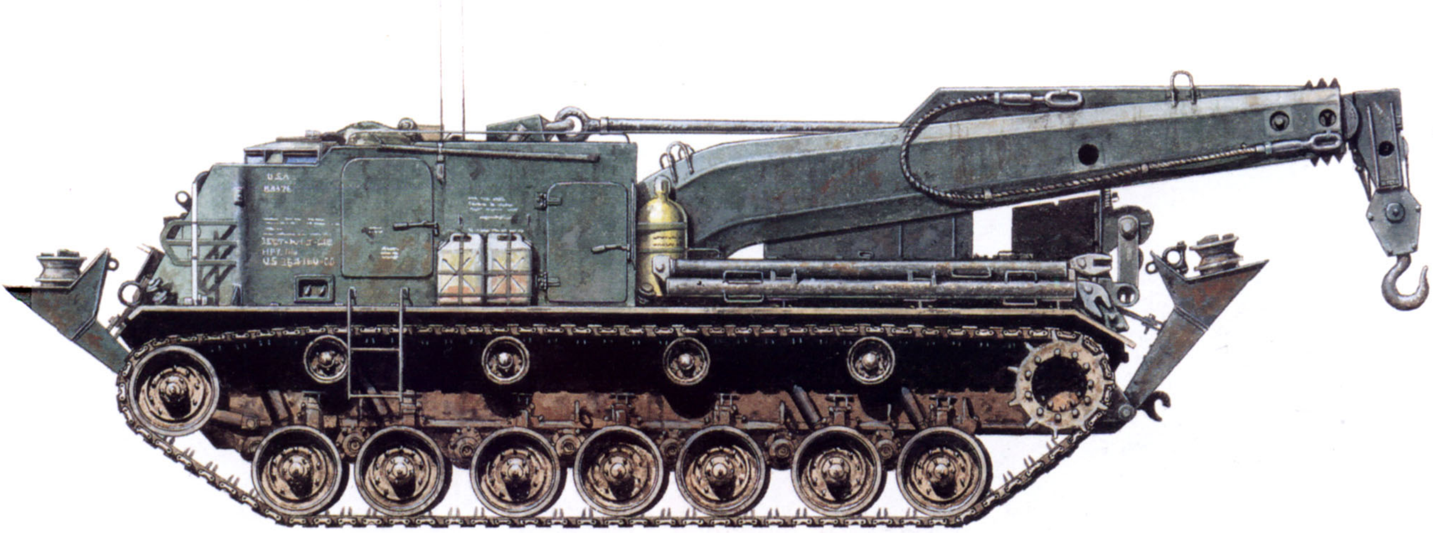


The newly developed FMC-made gun shield kits could be installed o both M113 (gasoline powered) and MI13A1 (diesel powered) armored personnel carriers and on gasoline o diesel-powered mortar carriers M125 (81mm) or M106 (4.2 inch). When fitted to a mortar carrier, only the commander's cupola shield was to be mounted, but in Vietnam, many mortar crews tended to add the side gun shields anyway. Shown in South Vietnam at the moment of firing is this M125 mortar carrier. Notice that this vehicle does have the FMC .50 caliber machine gun shield fitted but not the M60 machine gun shields.



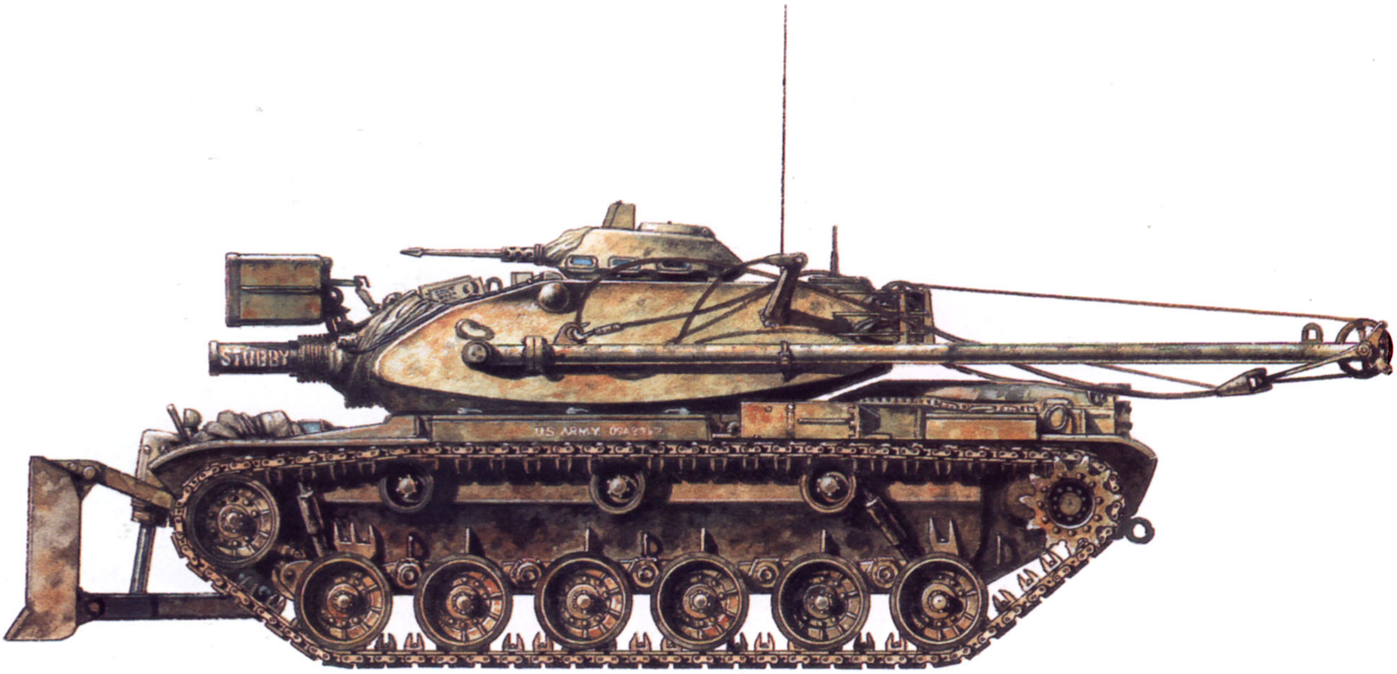
M48A3 Patton, U.S. Marine Corps 1st Tank Battalion, 1968.

The American-built M48A3 medium tank was the most numerous tank employed during the Vietnam War. Like most other American military vehicles of the time, the M48A3 was painted in overall olive drab. Reflecting the difficulty of supplying tank units in the field, the crew of this tank have attached a set of road wheels to the vehicle's turret. Other items seen on this vehicle include sandbags, wooden supply crates, and an extra jerry can.



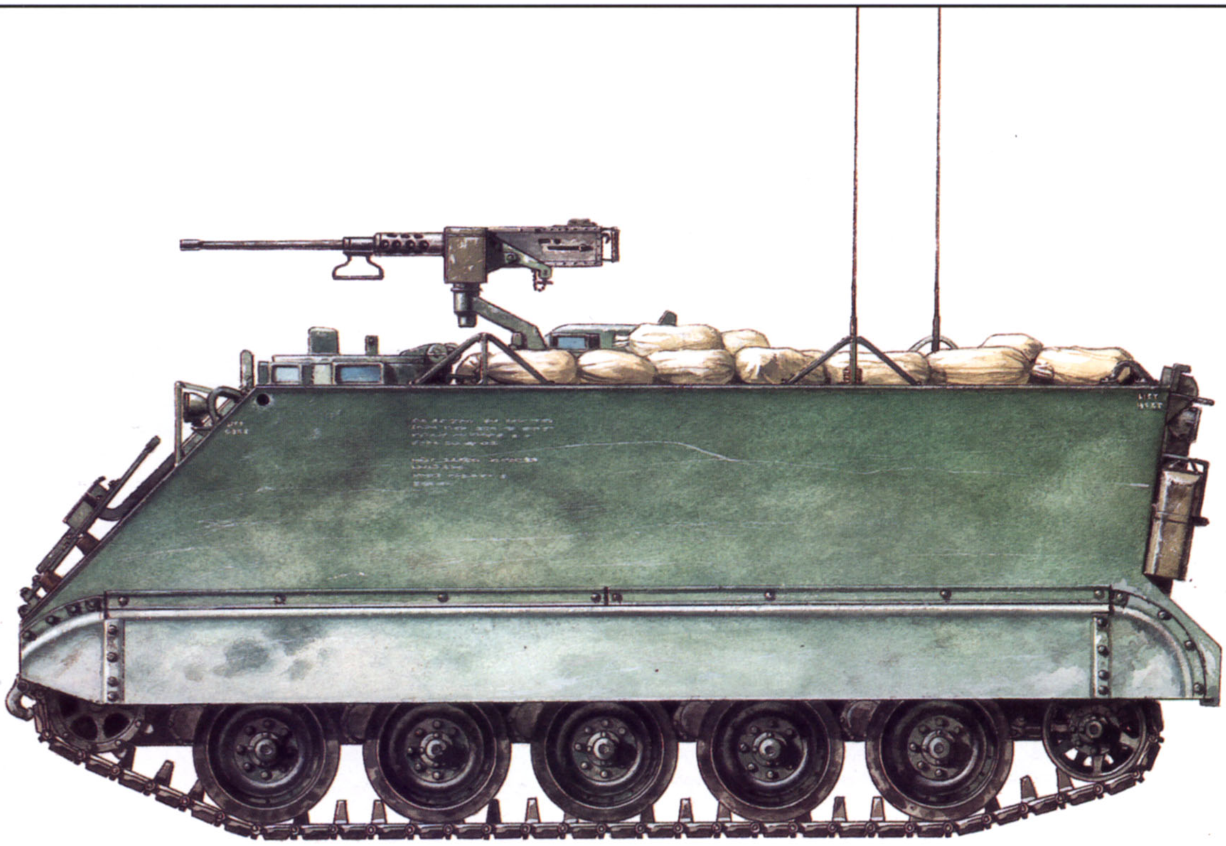
M51 Heavy Recovery Vehicle, U.S. Marine Corps 3rd Tank Battalion, Dong Ha, June 1967.

The heaviest armored vehicle used during the Vietnam War by the USMC, the M51 tank retriever was used to extricate damaged vehicles. Each Marine tank battalion had four of these vehicles, one per company. This massive 60 ton vehicle used the same suspension and track components as the M103 heavy tank. 3rd Tank Battalion lost two M51s to enemy action during the war.



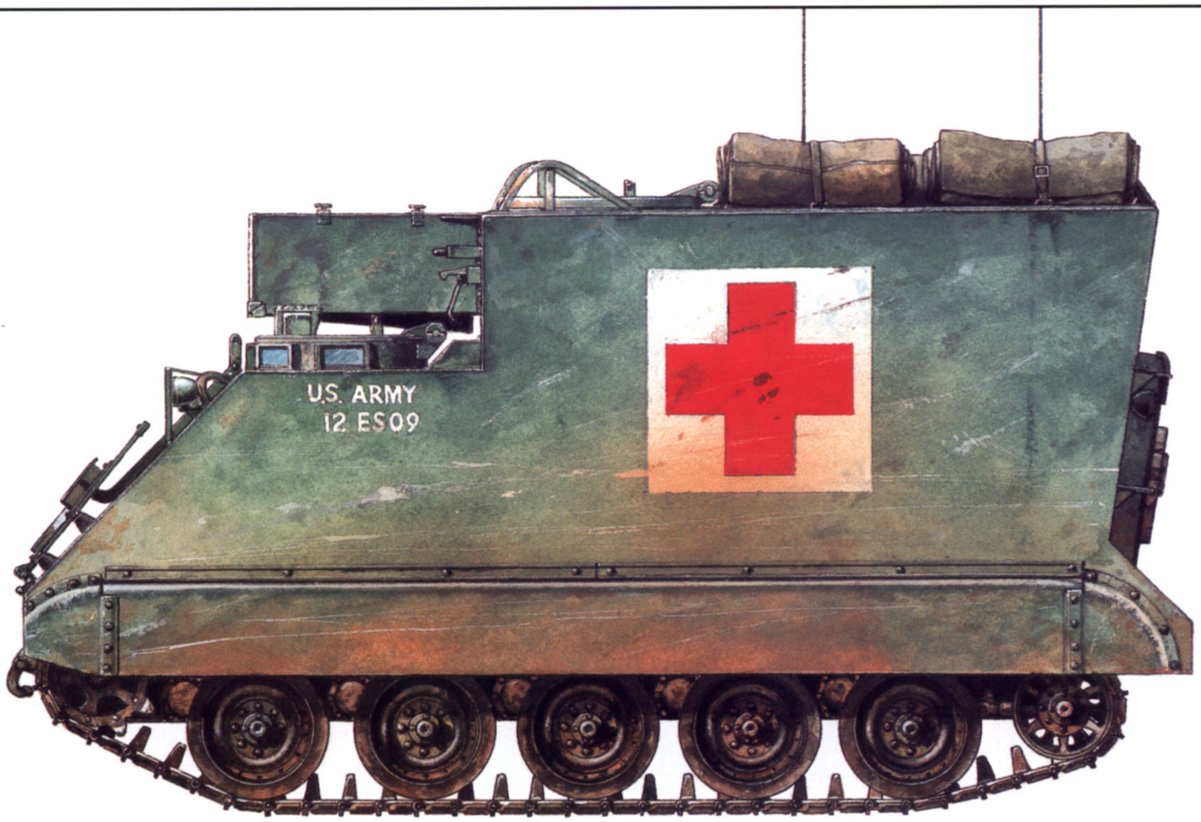
M728 CEV, U.S. Army 11th Armored Cavalry Regiment, 1969.

The M728 Combat Engineer Vehicle (CEV) was based on the hull and turret of the M60A1 tank. Equipped with a bulldozer blade and a large 'A' frame boom, the M728 CEV allowed combat engineers to perform a variety of jobs on the battlefield under armor protection. The 165mm demolition gun was designed to break-up concrete obstacles and highly effective for fire support.



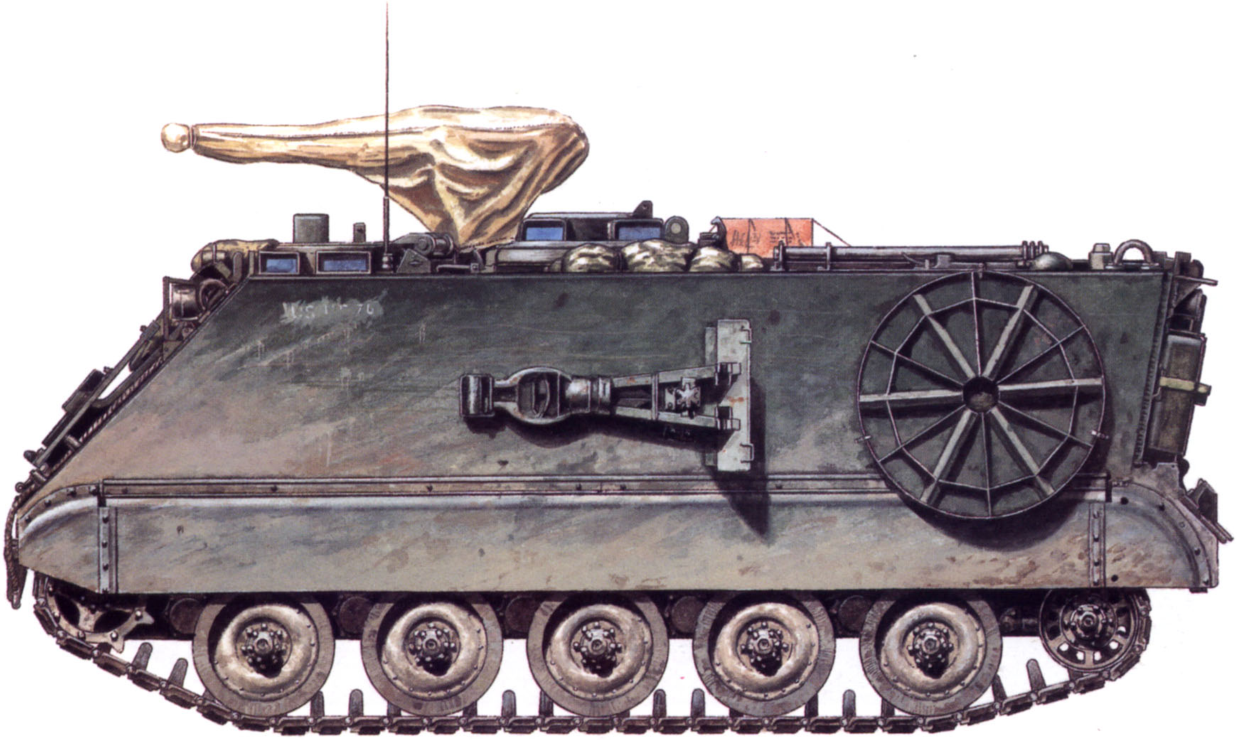
M113 APC, U.S. Army 1st Infantry Division, Saigon, 1965.

Early versions of the M113 armored personnel carrier (APC) sent to Vietnam were armed only with a single unprotected .50 caliber machine gun. Thi early model M113 has been outfitted with a number of sandbags around the rear hatch. These sandbags provided both additional protection for the troop firing their weapons as well as a way of steadying their weapon when the vehicle was moving. Later model M113s was configured to the ACAV version.



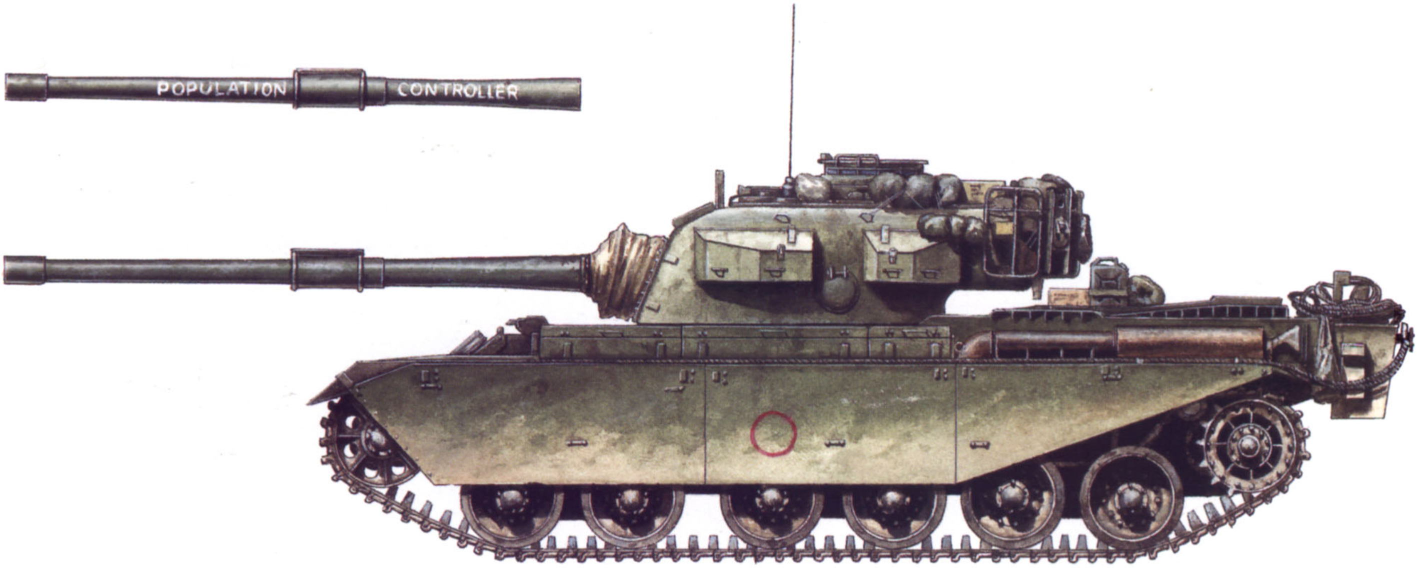
M577A1 Field Aid Station, U.S. Army 11th Armored Cavalry Regiment, Xua Loc, January 1967.

Based on an enlarged version of the M113, the M577A1 had a raised rear compartment to allow personnel to stand up in the vehicle. The M577A1 was employed as a command post, communications vehicle, artillery fire direction center, as well as a mobile aid station. The enemy often used the red crosses as aiming points for RPGs, paying no attention to the role of the ambulances. Many such vehicles were armed for self-defense.



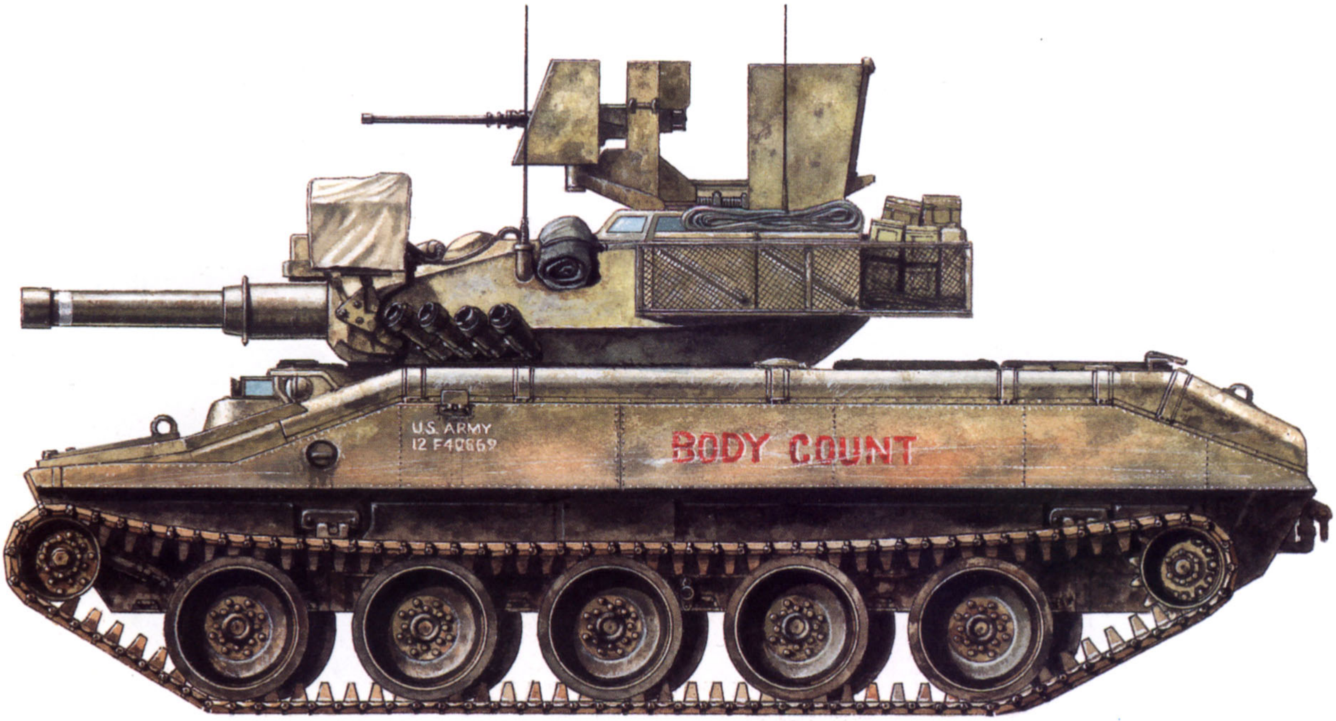
M106 Mortar Carrier, U.S. Army 4th Armored Cavalry Regiment, Phuoc My, 1967.

Fitted with an 4.2 inch mortar on a rotating turntable mounted in the rear of the vehicle, the M106 mortar carrier provided quick and highly mobile firepower to U.S. Army ground units. The mortar's baseplate and tripod can be stored on the outside of the vehicle. These devises were used when the mortar was dismounted from the vehicle.



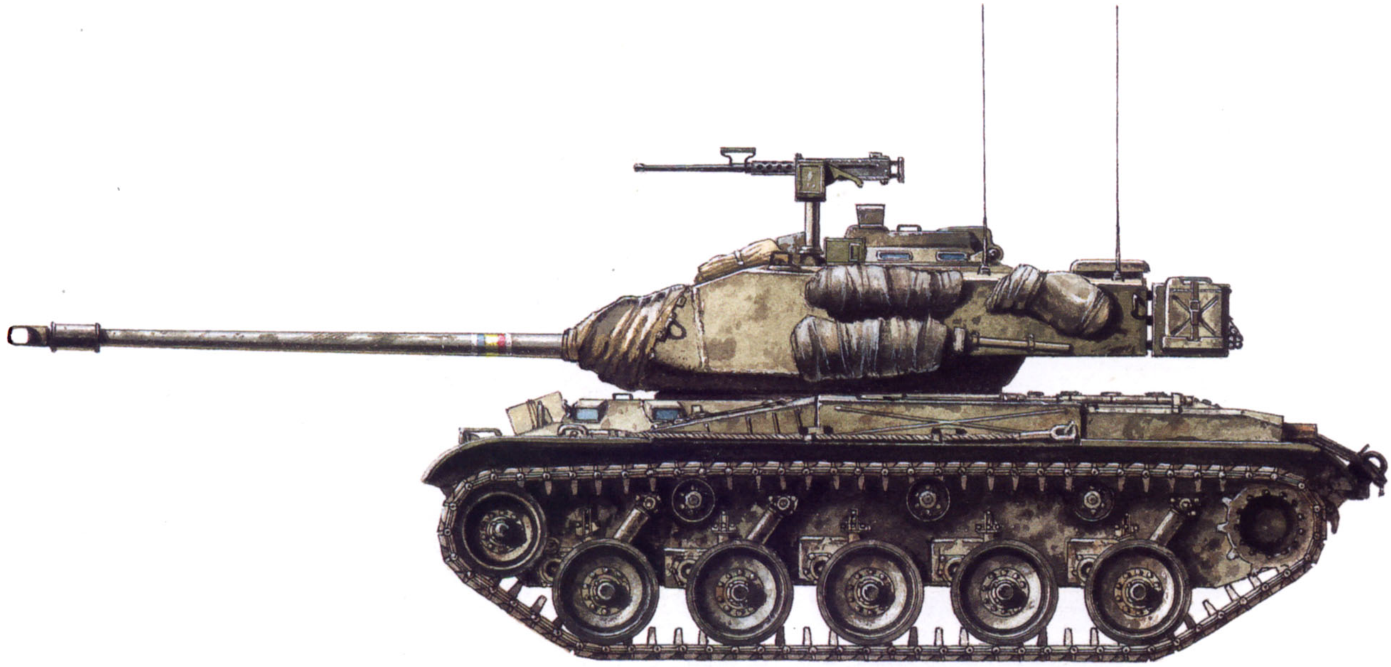
Centurion Mark 5, RAAC 1st Armoured Regiment, Vung Tau, February 1968.

One of the first batch of Royal Australian Armoured Corps (RAAC) to arrive in South Vietnam, this vehicle comes with bazooka plates, trackguards, headlight assemblies on the glacis plate. Combat experience quickly showed the Australian tankers that the side-mounted bazooka plates clogged with mud far too easily. The bazooka plates were soon removed from all Australian Centurion tanks in Vietnam.



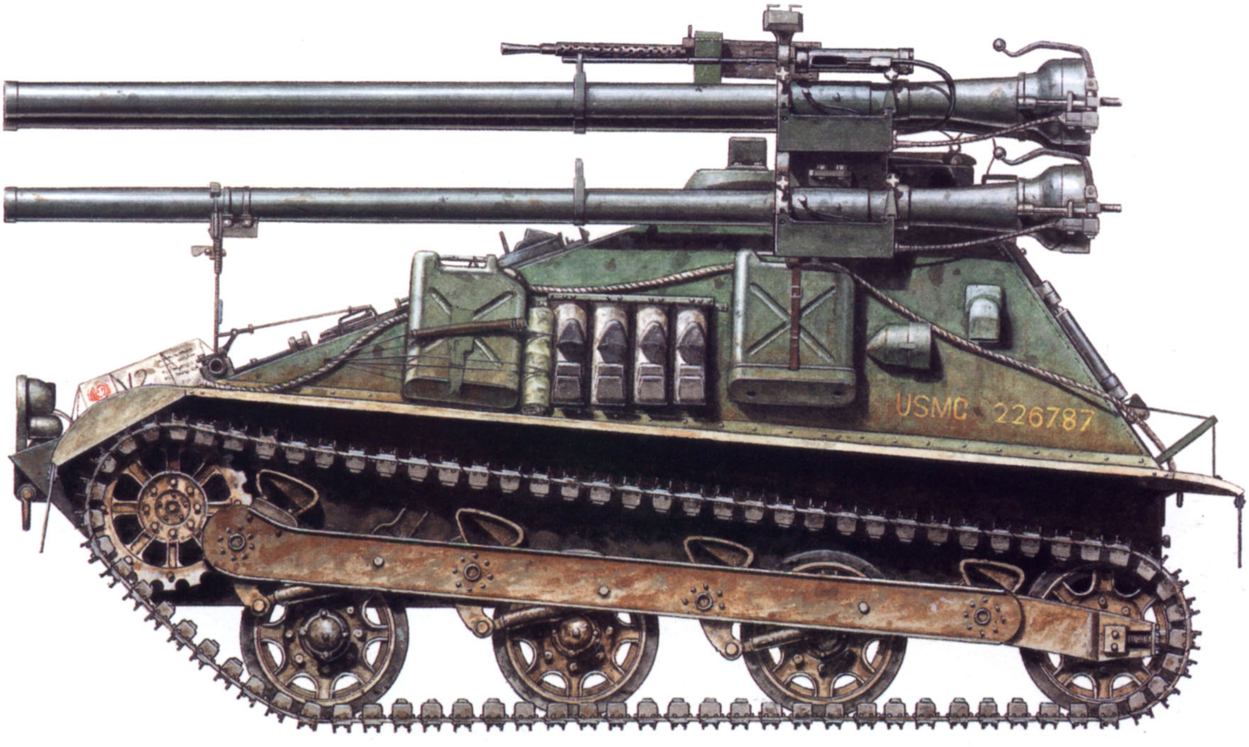
M551 Sheridan, U.S. Army 11th Armored Cavalry Regiment, Tam Ky, March 1971.

The M551 Sheridan was originally designed by the U.S. Army as a lightweight, airborne droppable assault vehicle. Rushed into production, the M551 was plagued by numerous technical problems throughout its time in service. Forced into a role it was never designed for, the M551 had a very checkered career during the Vietnam War. 'Body Count' is equipped with the purpose-built armor protection kit known as the 'bird cage' that offered all-round protection for the tank commander when observing or using his machine gun.



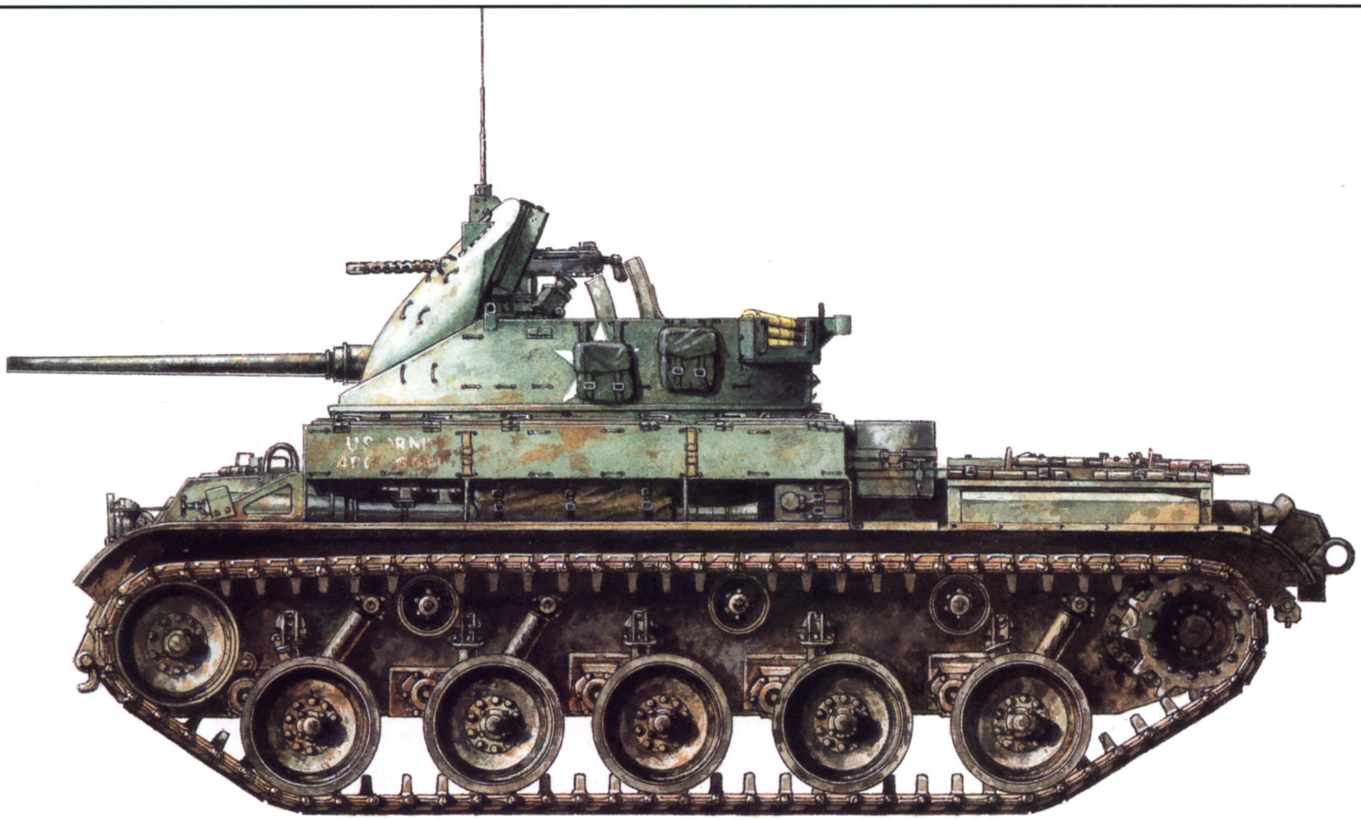
M41A3 Walker Bulldog, ARVN 5th Armored Cavalry Regiment, Da Nang, 1966.

The M41A3 Walker Bulldog was supplied to the South Vietnamese Army beginning in 1965. Considered unsuitable for use in South Vietnam by the U.S. Army due to its very thin armor and cramped interior, the simplicity and mechanical reliability of the M41A3 light tank was felt to be more suitable to the smaller sized ARVN cavalry troopers. This M41A3 has the glacis plate covered with ammo boxes which is a common practice.



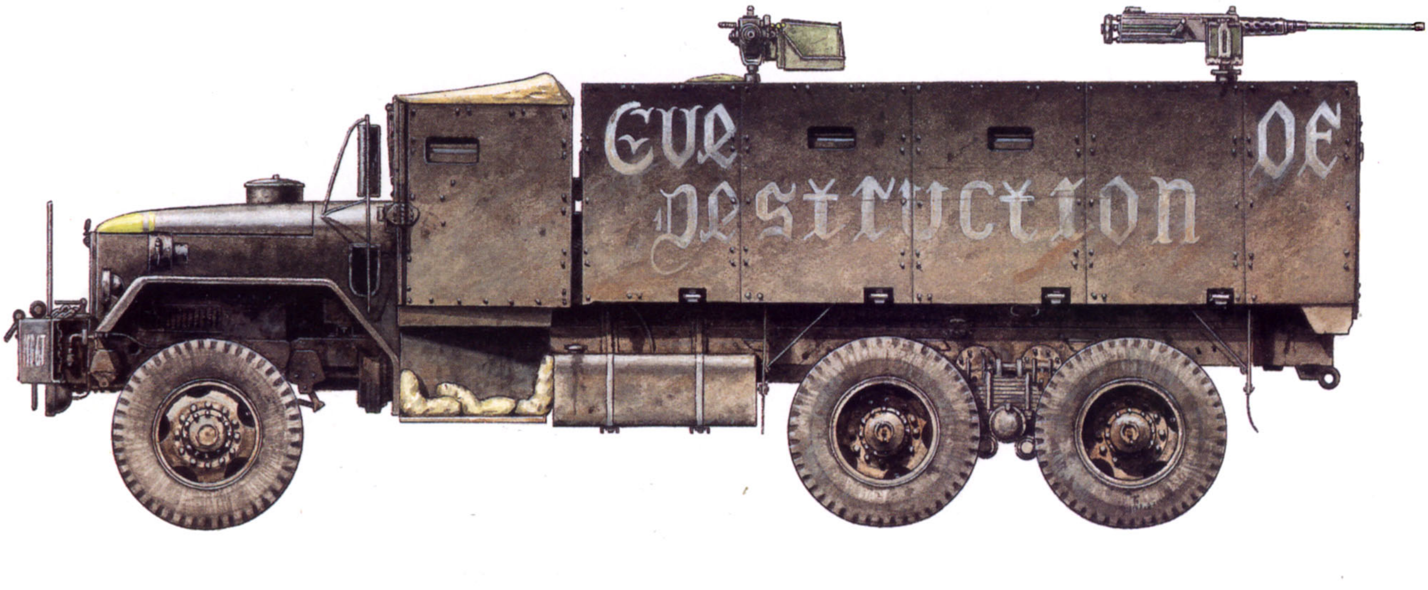
M50A1 Ontos, U.S. Marine Corps 1st Antitank Battalion, Chu Lai, May 1966.

Employed by the USMC in Vietnam was the M50A1 Ontos antitank vehicle. This vehicle was lightly armored and was equipped with six 106mm recoilless rifles, three on each side of the vehicle. Because of the massive backblast from the recoilless rifles when fired and the need to reload the weapons from outside the vehicle, most of the Ontos were used in perimeter defense of Marine Corps bases. The .50 caliber spotting rifles were installed on top of the top recoilless rifles. A .30 caliber machine gun was mounted between the recoilless rifles. Most Ontos carried spare tracks across the glacis plates for added protection.



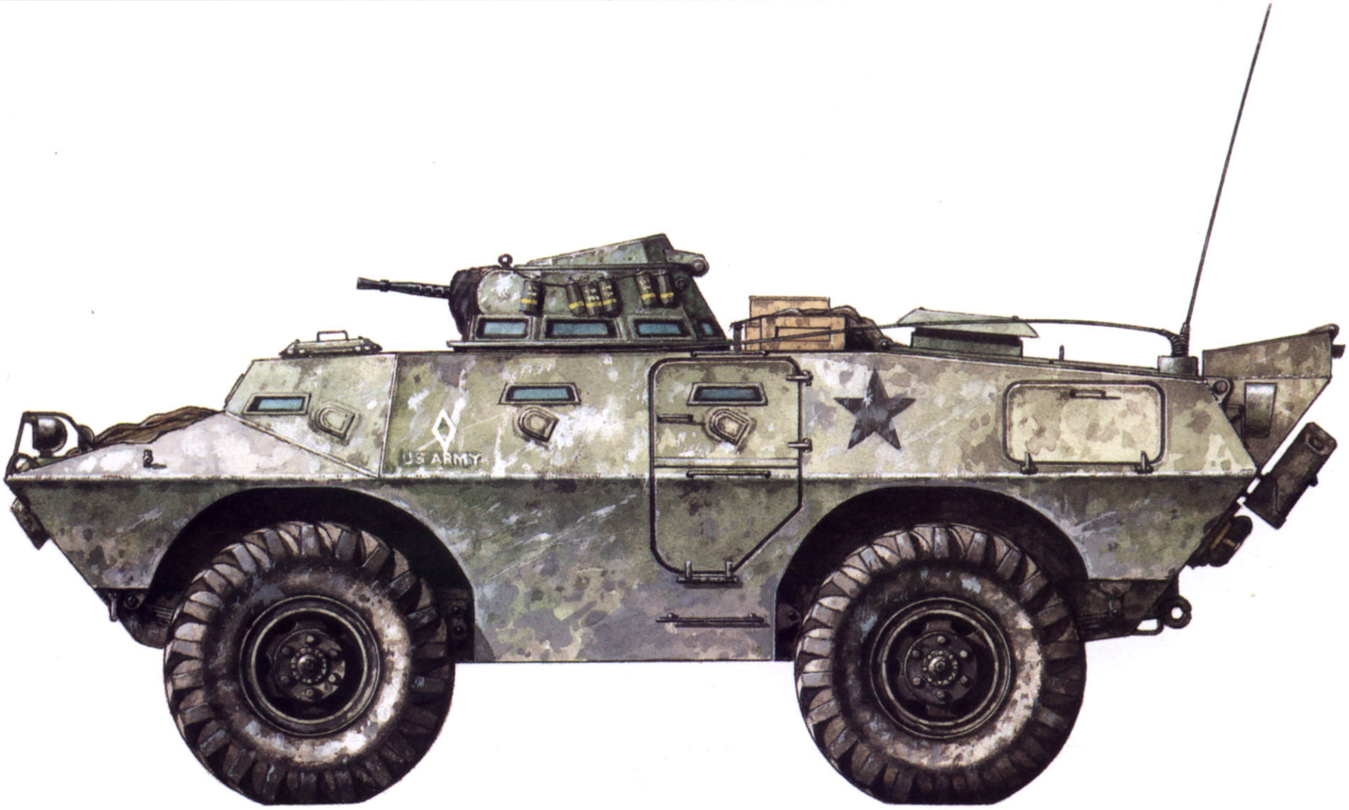
M42A1 Duster, U.S. Army 2nd Artillery, Lai Khe, 1969.

The M42A1 Duster was basically an M41 light tank chassis modified into a self-propelled air defense weapon. Armament consisted of twin 40mm Bofors guns mounted in an open-topped turret. There was no radar system fitted. Since there was no threat from enemy aircraft, the Dusters sent to Vietnam were used as base defense weapons or convoy escort missions.

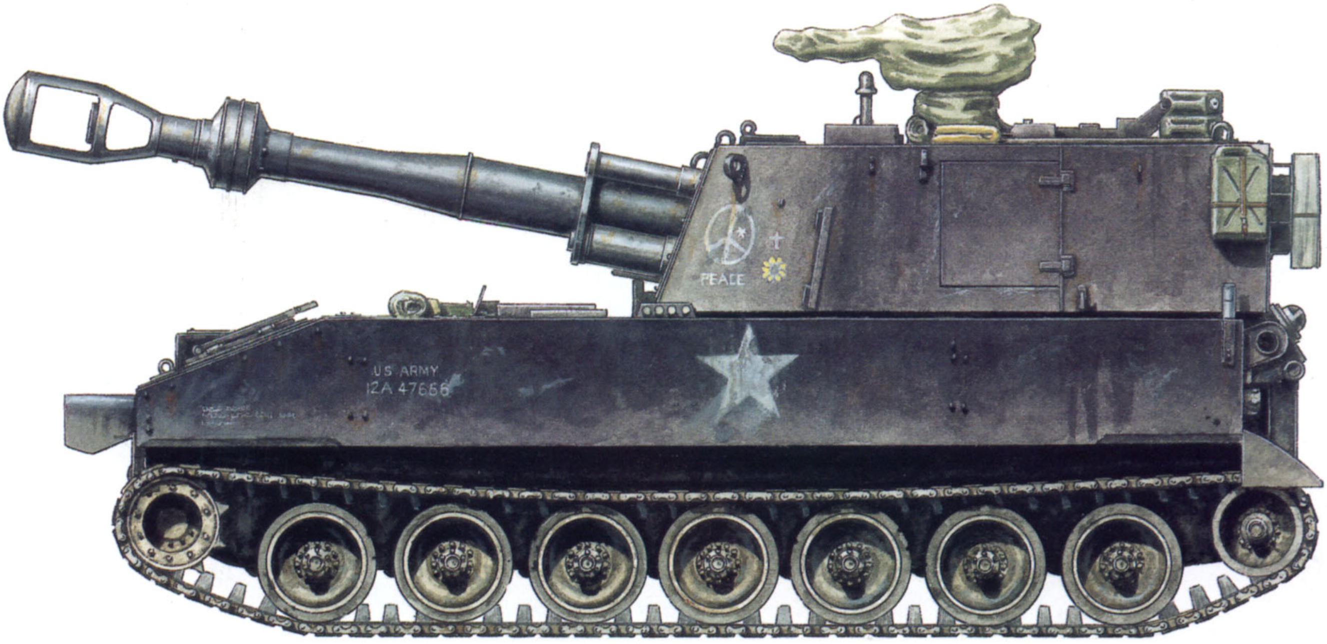


Gun Truck, U.S. Army 8th Transportation Group, Central Highlands, 1966.

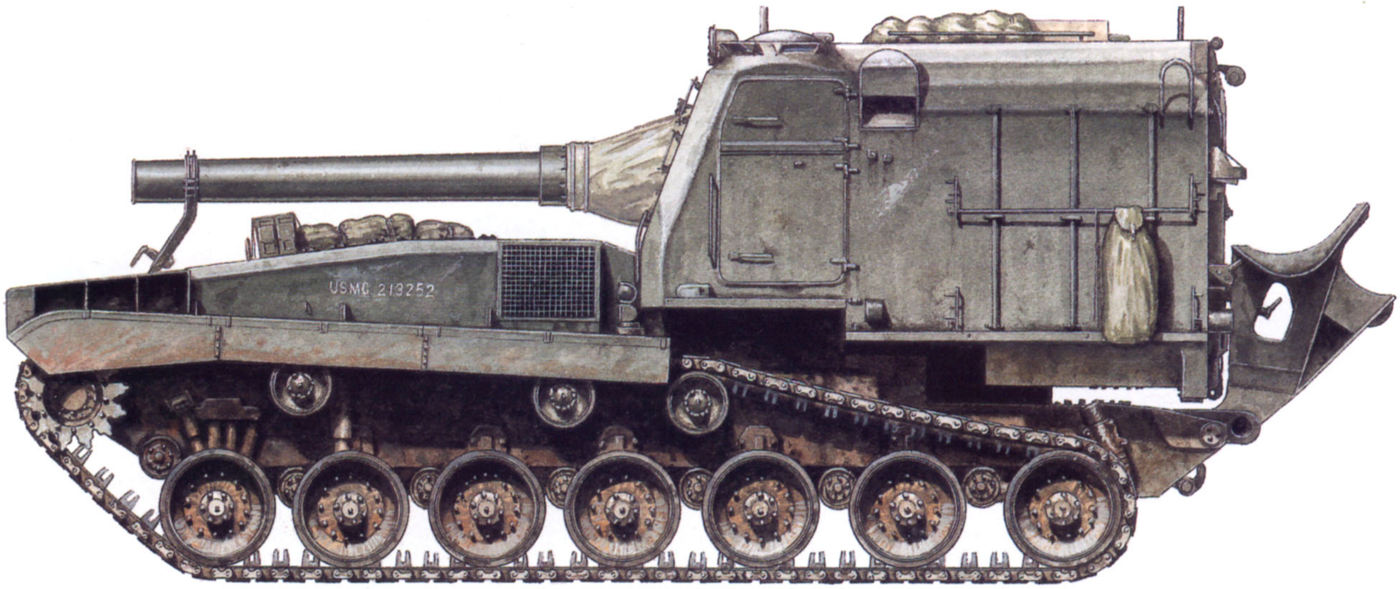
Due to the shortage of armored vehicles to escort supply convoys, the U.S. Army Military Police (MP) units stationed in South Vietnam began building their own makeshift armored vehicles. Using different types of cargo trucks the MPs outfitted them with thin armor plates and a variety of weapons. 'Eve Of Destruction' is mounted with two .50 caliber machine guns.



M706 Armored Car, U.S. Army MP, Qui Nhon, 1970.
The constant ambushing of American military convoys in South Vietnam made the Army to decide to buy large numbers of the commercial developed and built armored car known as the V-100 Commando. The M706 was a variant of the V-100 with twin 7.62mm machine guns in a turret. The MP units used a lot of these M706s in convoy escort and base security missions.

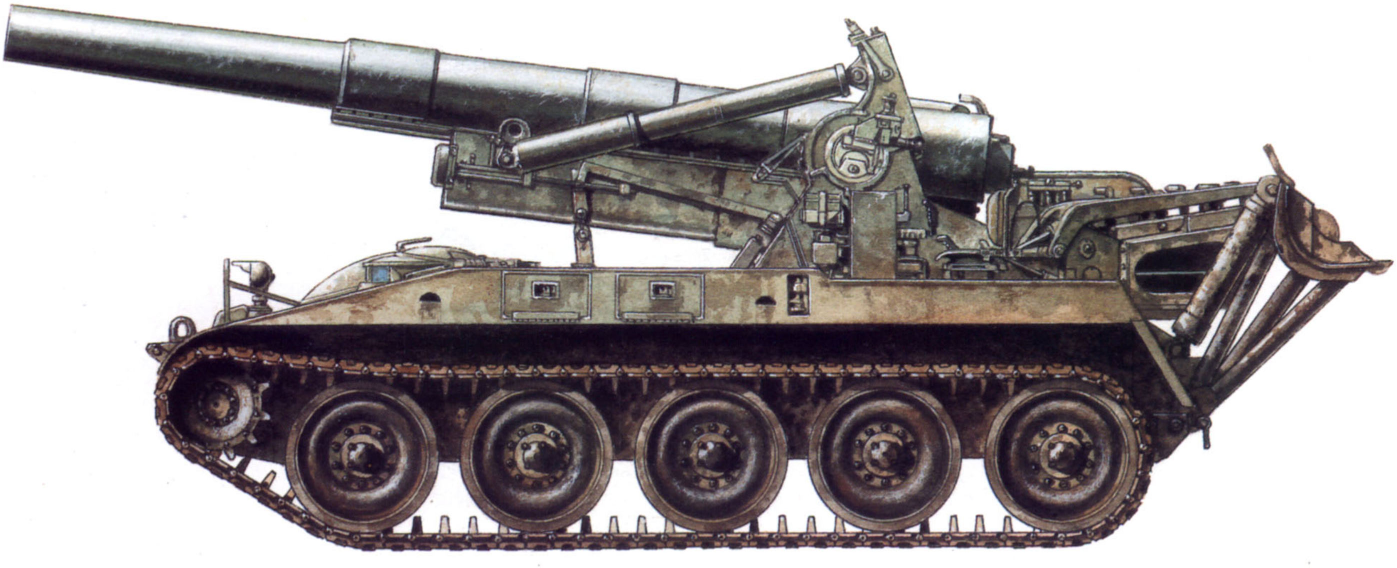


M109 Self-propelled Howitzer, U.S. Army 11th Armored Cavalry, 1969.
The M109 arrived in South Vietnam in 1966. Operated by a six-man crew the M109 is protected by aluminum armor and is air transportable. The 155mm howitzer had a range of 15 km and served as the direct support artillery for the armored and mechanized divisions.



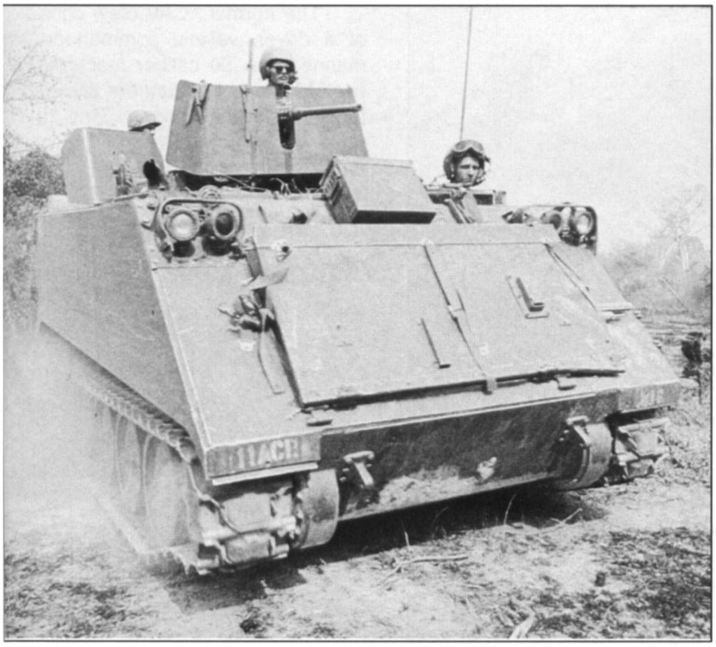
M55 Self-propelled Gun, U.S. Marine Corps 1st Gun Battery, February 1967.

Among the self-propelled artillery weapons used by the USMC in Vietnam was the M53 and M55. The only difference between the two vehicles was the weapon mounted. The M53 mounted a long-barrelled 155mm gun, while the M55 mounted an 8 inch howitzer. The running gear of both vehicles were based on the M47 and M48 Patton tanks.

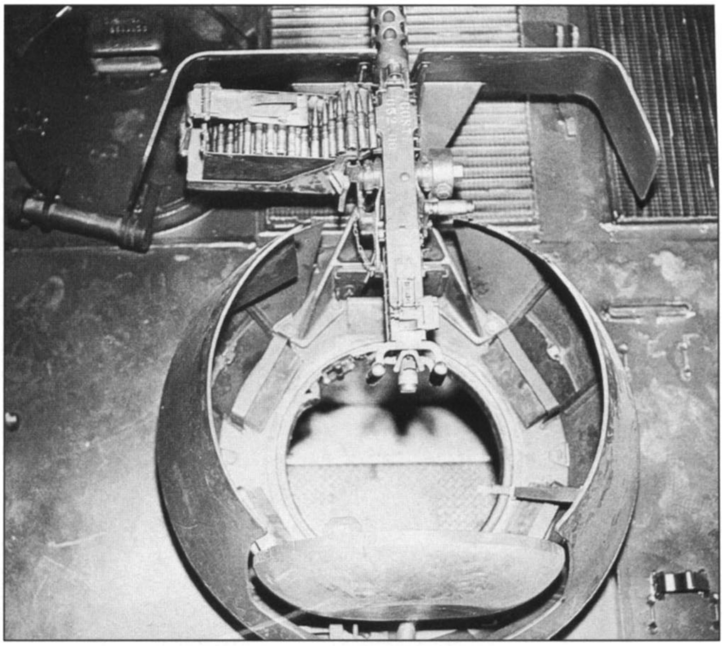


M110 Self-propelled Howitzer, U.S. Army 8th Artillery, 1968.

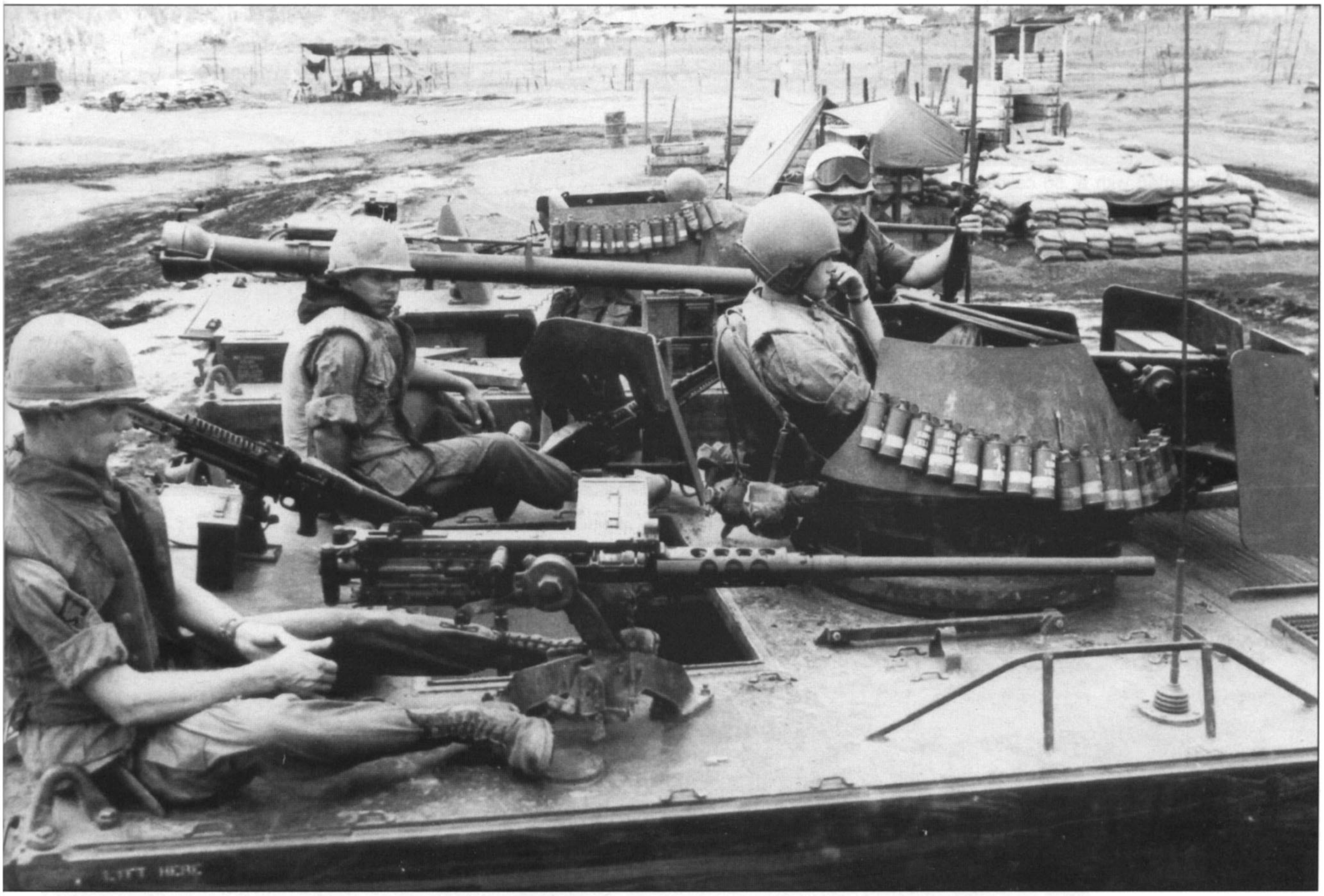
The M110 self-propelled 8 inch howitzer was employed by most divisional artilleries. The M110 chassis had no armored protection for its 13-man crew therefore it was normally emplaced in fire support bases. The 8 inch howitzer was very accurate and had a range of 17 km.



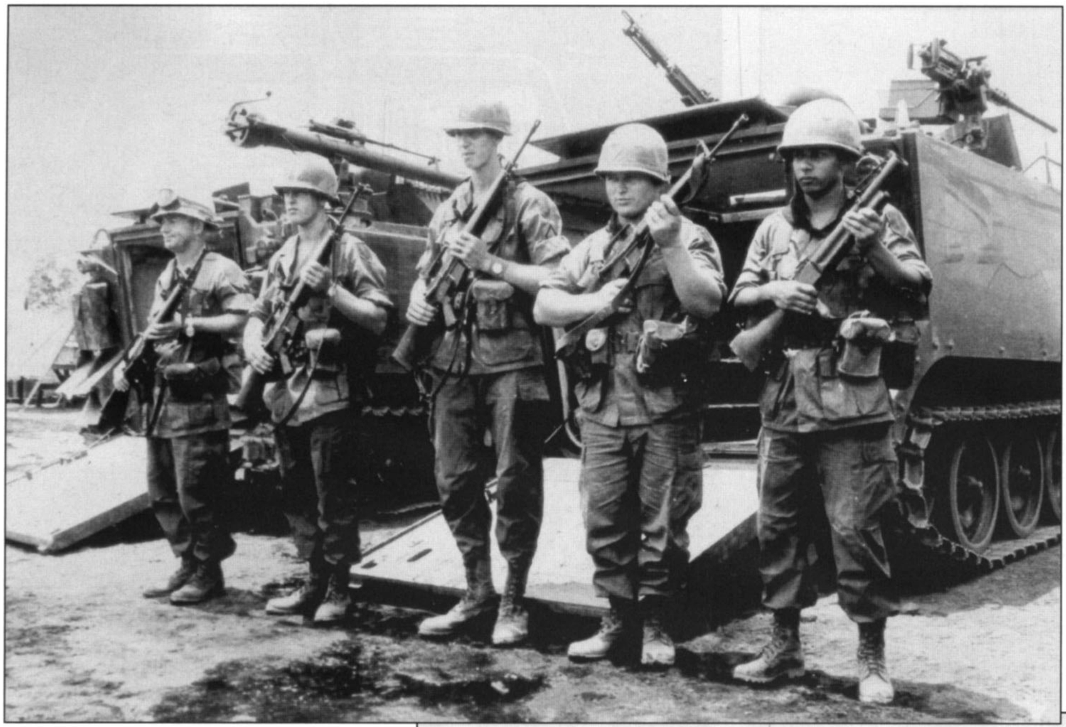
In 1966, the first diesel-powered M113s were produced by FMC and designated the M113Al. The gasoline engine in earlier models was replaced by a 212 horsepower V-6 diesel engine. With increased fuel economy and greater range, the M113Al was quickly introduced into South Vietnam. Earlier gasoline powered M113s were upgraded at Army depots as soon as possible. By mid-1968 the entire fleet of the U.S. Army M113s in Vietnam were powered by diesel engines.



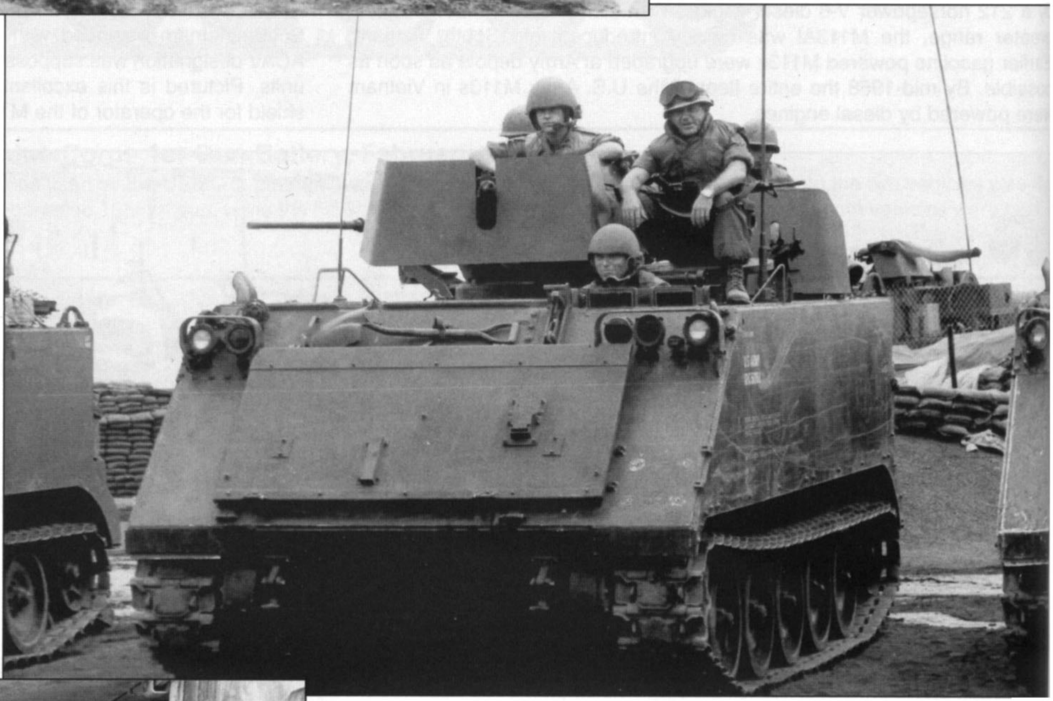
With all these modifications, the M113 was now called the Armored Cavalry Assault Vehicle (ACAV). The new name was started by the 11th Armored Cavalry Regiment and soon spread out to all U.S. Army units in South Vietnam equipped with the FMC gun shield kits. Technically, the ACAV designation was supposed to be only applied to the M113s of Cavalry units. Pictured is this excellent overhead shot of the FMC-designed gun shield for the operator of the M113's .50 caliber machine gun.



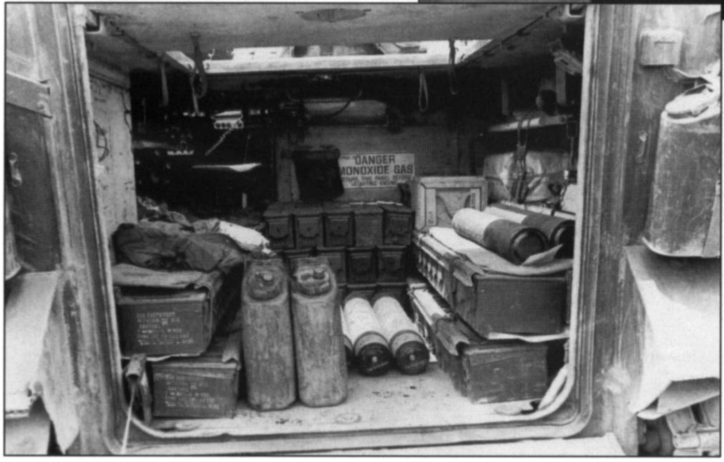
When employed as an ACAV the M113 carried only five or six crew members instead of the ten or twelve soldiers it was originally designed for. Because the troops onboard the ACAV would not be used as dismounted infantry, the vehicle needed only to carry enough soldiers to drive and fire the various weapon systems mounted on the vehicle. The crew of the vehicle pictured have replaced one of their M60 machine guns positions with a larger and more powerful .50 caliber machine gun. Also visible is an M60 machine gun (minus gun shield) mounted on the rear personnel hatch of the vehicle. The M113 in the background mounts a 106mm recoilless rifle.



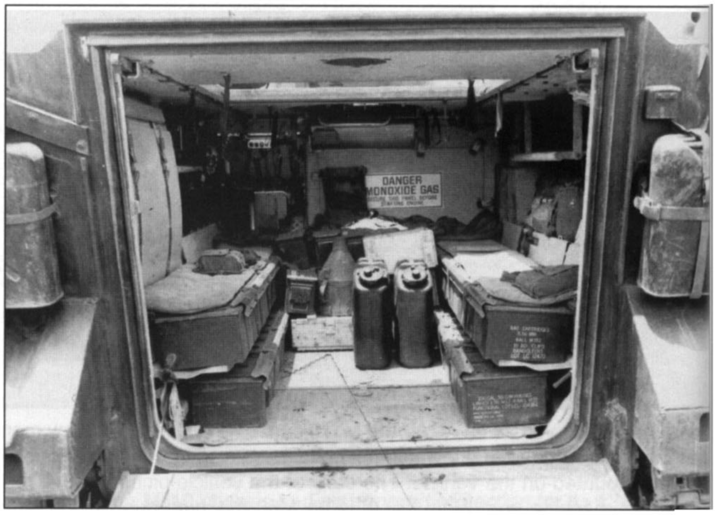
The normal ACAV crew consisted of a driver, vehicle commander who manned the .50 caliber machine gun, two M60 machine gunners and one or two ammunition loaders. One of the ammunition loaders would also be armed with an M79 40mm grenade launcher as pictured.



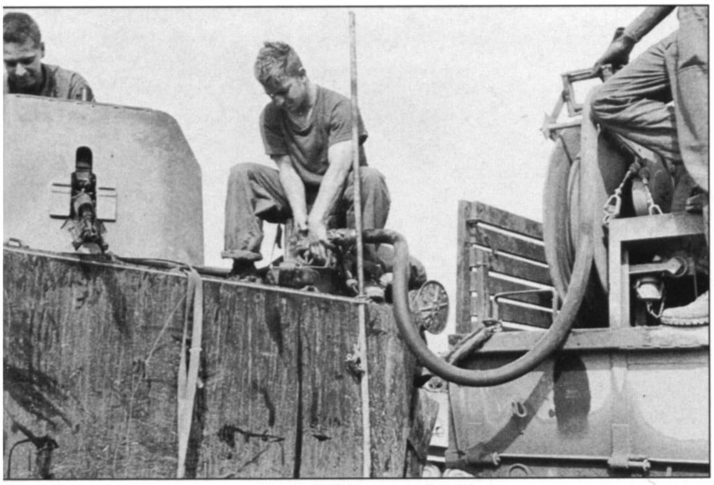
This picture shows the ACAV crew and vehicle mounted with a .50 caliber machine gun.



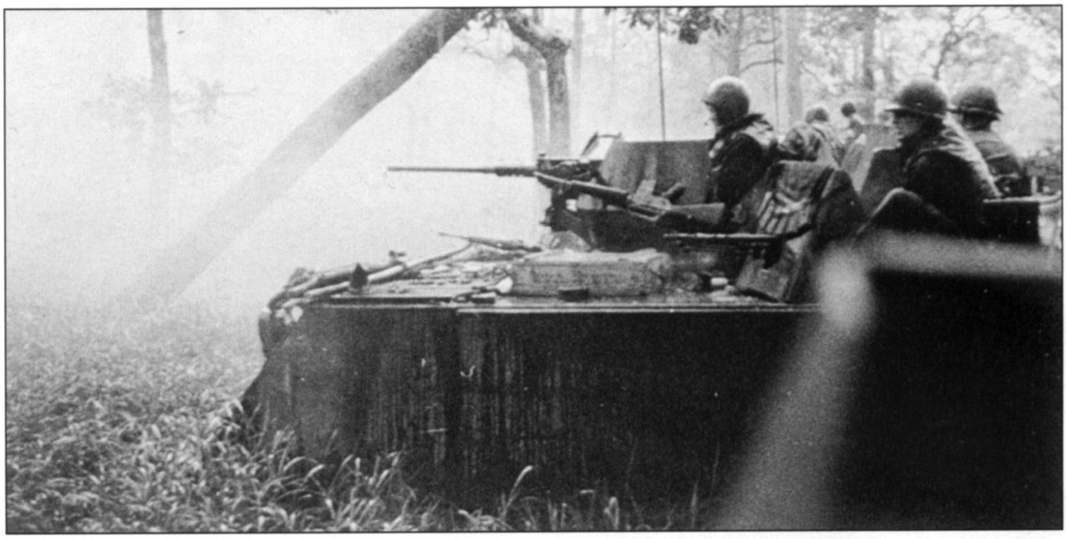
This particular ACAV vehicle mounts a very large 106mm recoilless rifle in place of one of the typical M60 machine gun positions. Visible is the tarp that covers much of the vehicle commander's .50 caliber machine gun from the elements and dust. It is unknown if this type of tarp or covering was standard issue or strictly locally made for the unit's vehicles.



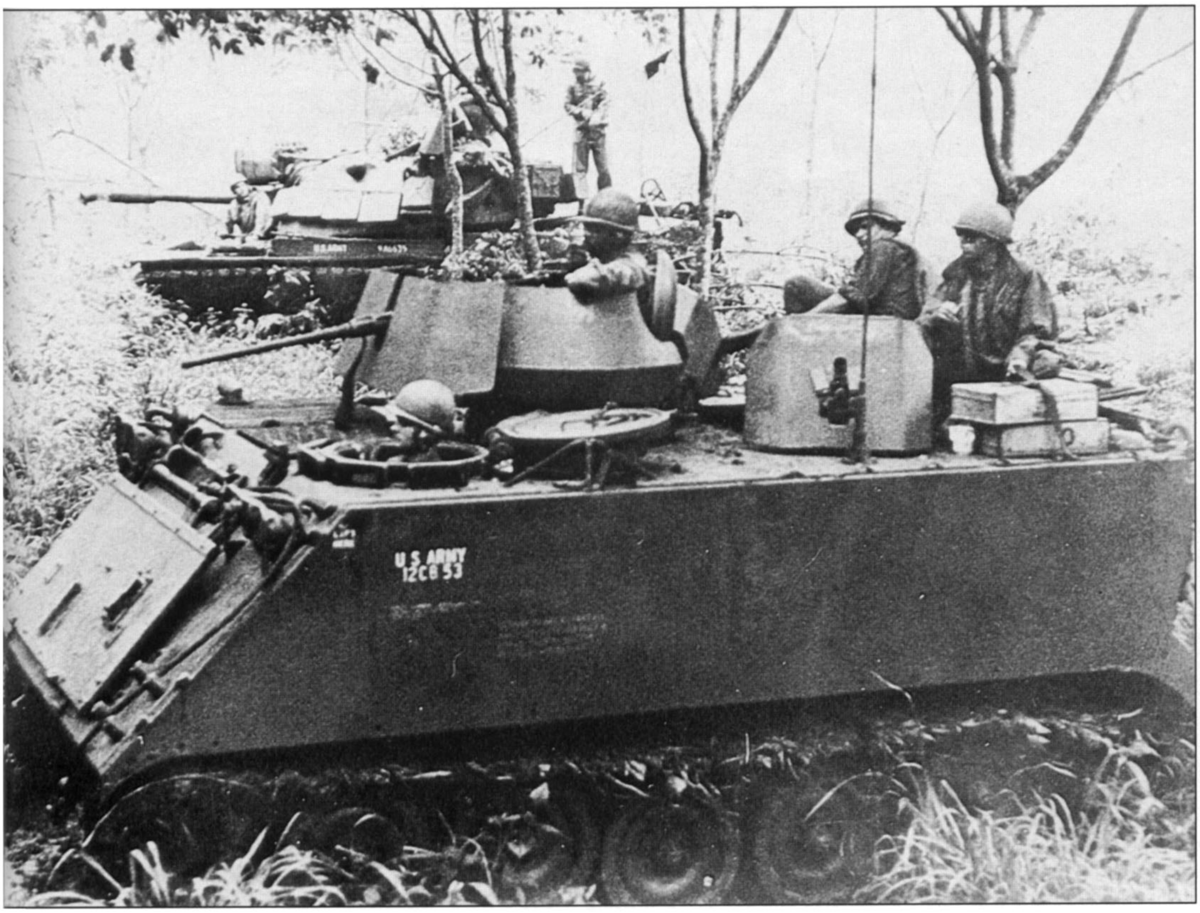
Pictured is the interior of an ACAV vehicle.



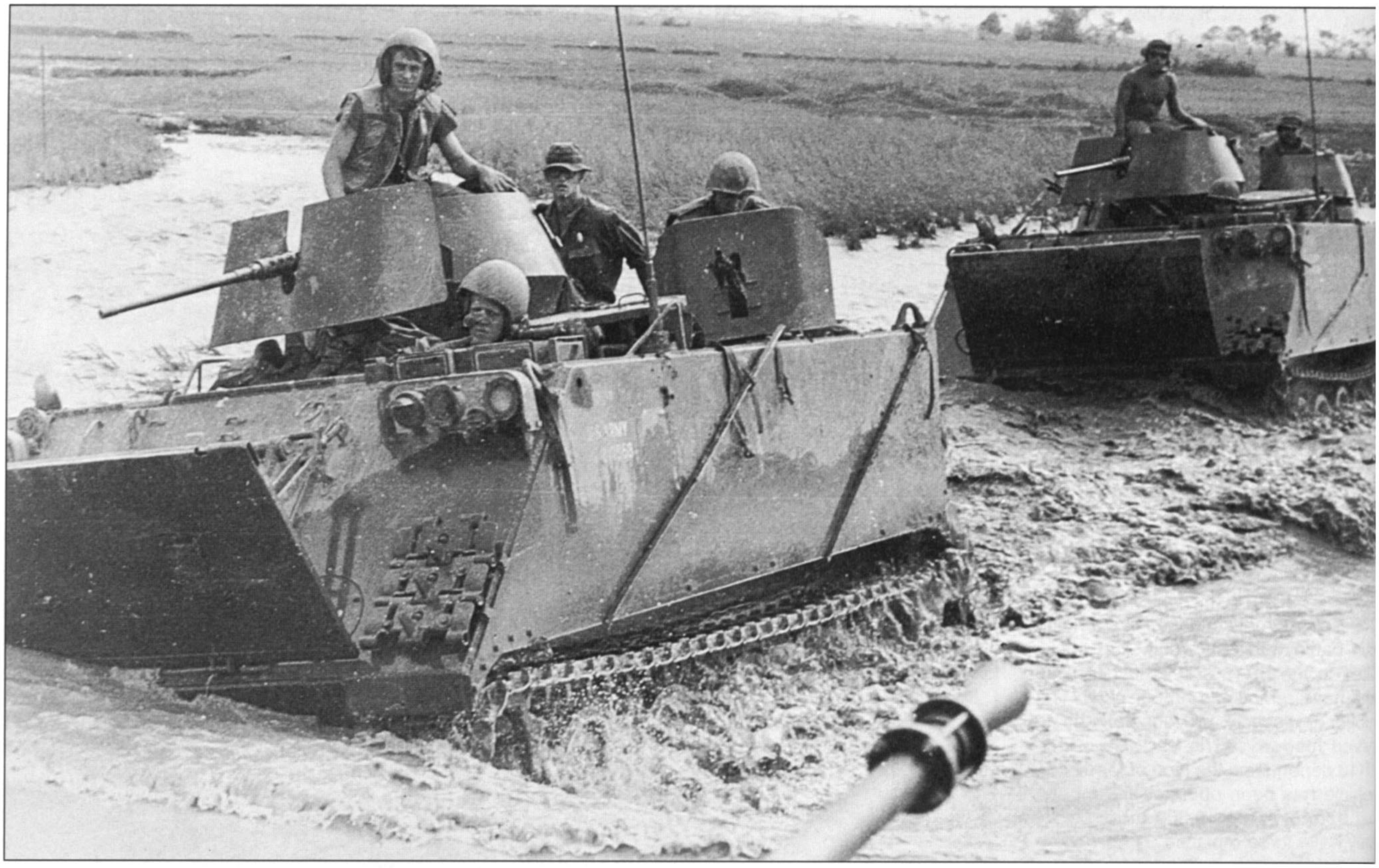
In Vietnam refueling your M113 was a very important job that had to be done as often as possible. ACAV commanders and their units never knew when their fuel supply vehicle might be ambushed or destroyed by enemy mines.



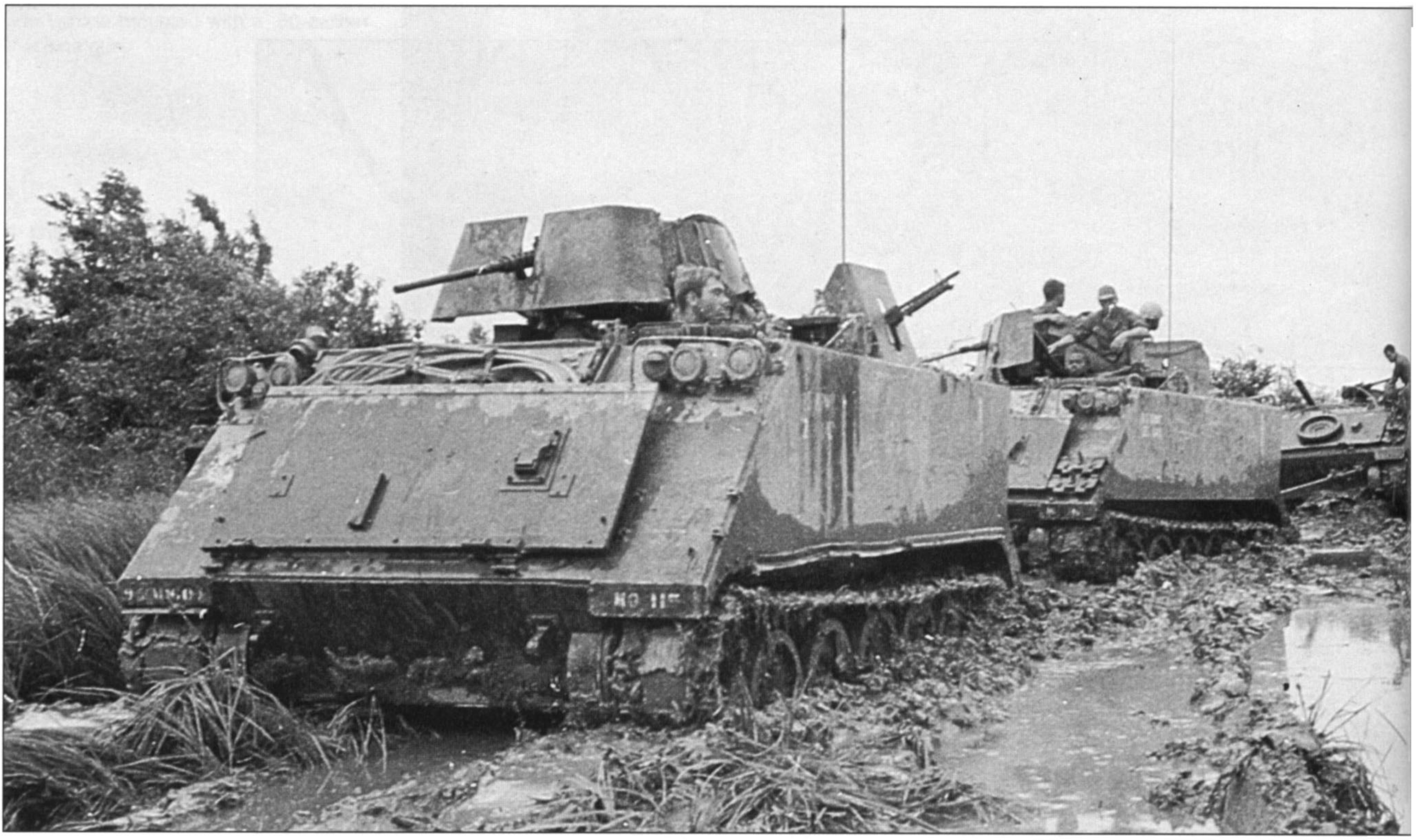
This ACAV is engaged in a running gun battle with a VC unit. The tracks fitted to the M113 are 15 inches wide and have removable rubber pads. The rubber pads help prevent damage to paved roadways. The track life on the M113 depends on the type of terrain the vehicle has been operated in, but can run from 3,000 to 10,000 miles before they have to be replaced.



Pictured during a large-scale search and destroy operation in South Vietnam, an ACAV crew pauses for a break. In the background is a parked M48A3 Patton tank. The M113 is equipped with a torsion-bar suspension system with ten individual sprung, dual rubber-tired wheels, five on either side of the vehicle. There are no track return rollers. Hydraulically operated shock absorbers are also fitted to the vehicle. Older model M113s, used in South Vietnam, had about six inches of road wheel travel. Newer M113 models have up to eight inches of road wheel travel.

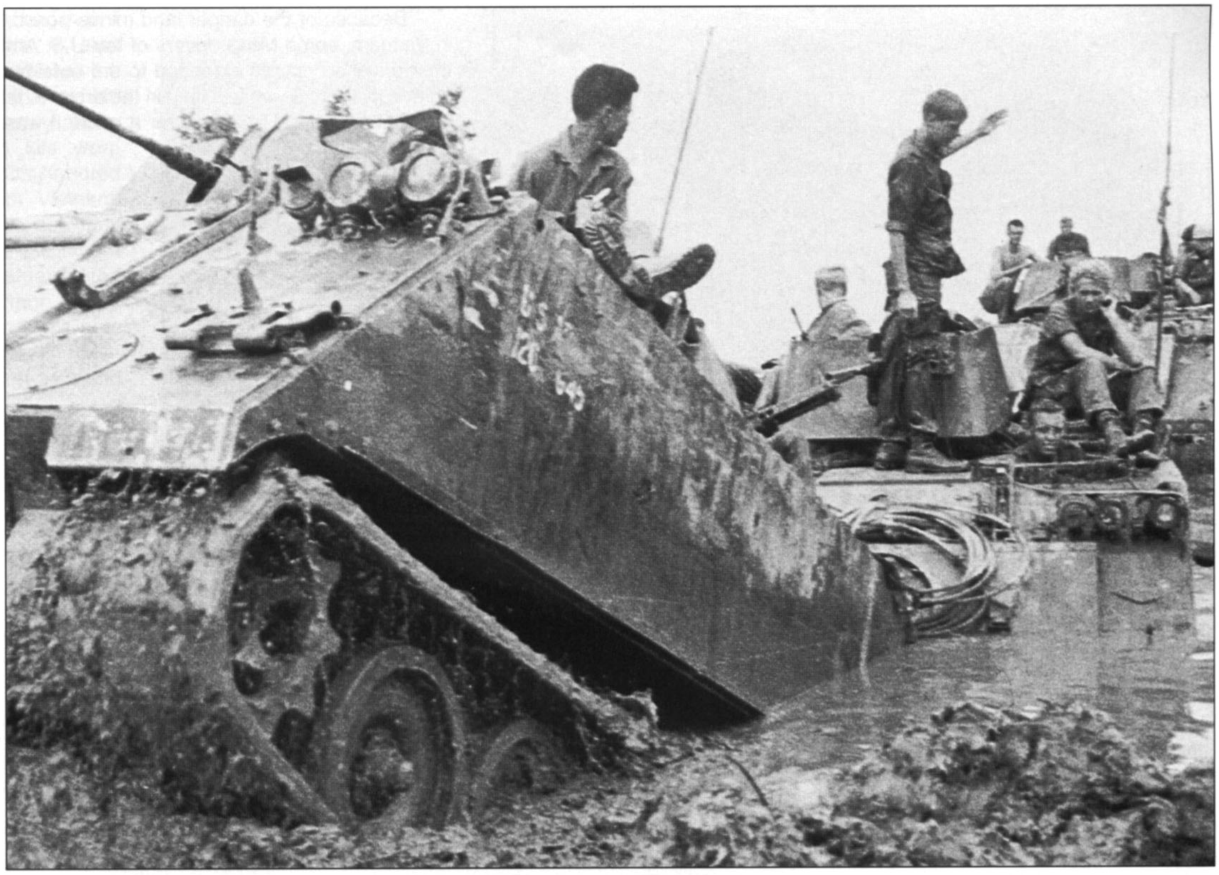


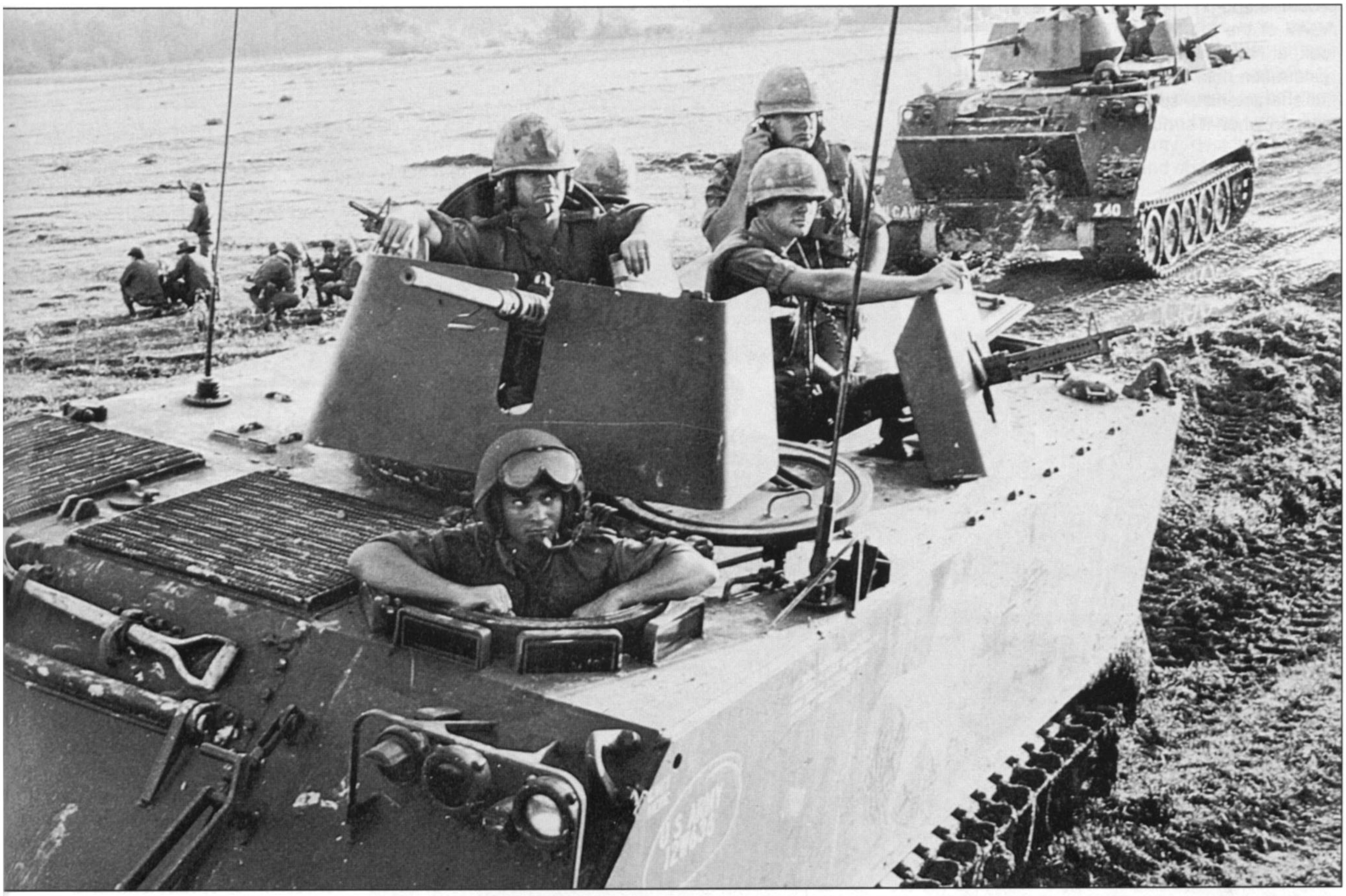
The hull of the M113 is fully watertight allowing the vehicle to cross lakes and slow-moving streams. To become amphibious, the vehicle driver turns on two bilge pumps. The trim vane, which folds back on the front hull of the vehicle, is extended forward. The trim vane helps maintain the correct balance of the vehicle in the water and prevents water from flowing over the front of the vehicle into the driver's position or the vehicle's front mounted engine. Since most of the weight of the vehicle is in front, it would go nose-down if not used. This formation of ACAV vehicles is traversing a flooded marsh.



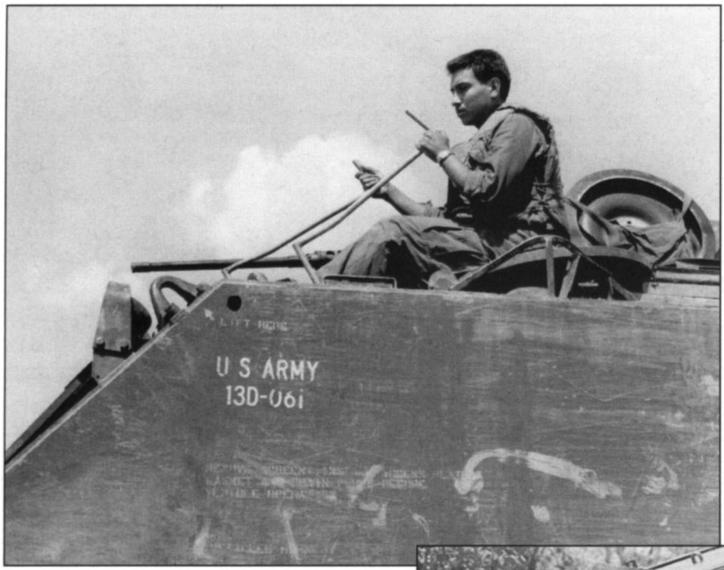
In the water, the M113 is propelled by the forward motion of its tracks. It can reach a top water speed of 3.5 miles per hour on a calm body of water. Steering in the water is the same as on land. Because of all the extra equipment normally added to the M113s employed in South Vietnam, the vehicle's amphibious ability was seriously degraded and was rarely used. This unit of ACAVs is trying to use a water-logged dirt road.

The employment of ARVN M113 units tended to differ from U.S. Army practice. ARVN operations were always much shorter in duration than U.S Army operations and their M113 units always had an infantry unit attached to fight on foot if necessary. Superstition even modified doctrine since ARVN units seldom took eleven or thirteen M113s on an operation because they were considered unlucky numbers. Shown is a number of ACAVs that have become mired in a muddy Vietnamese stream.

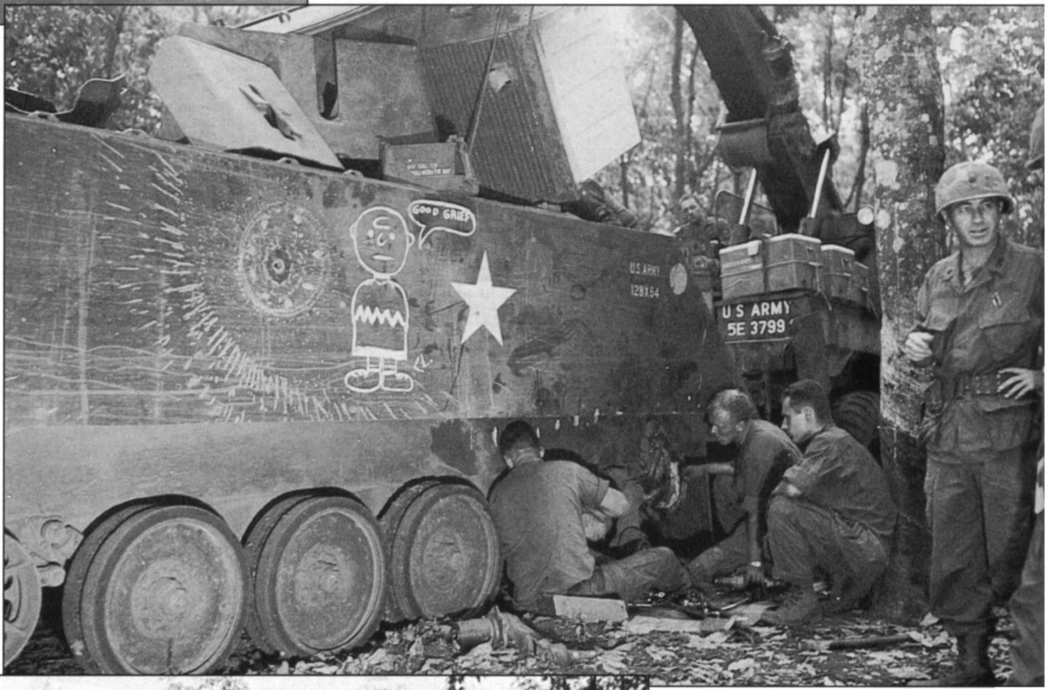




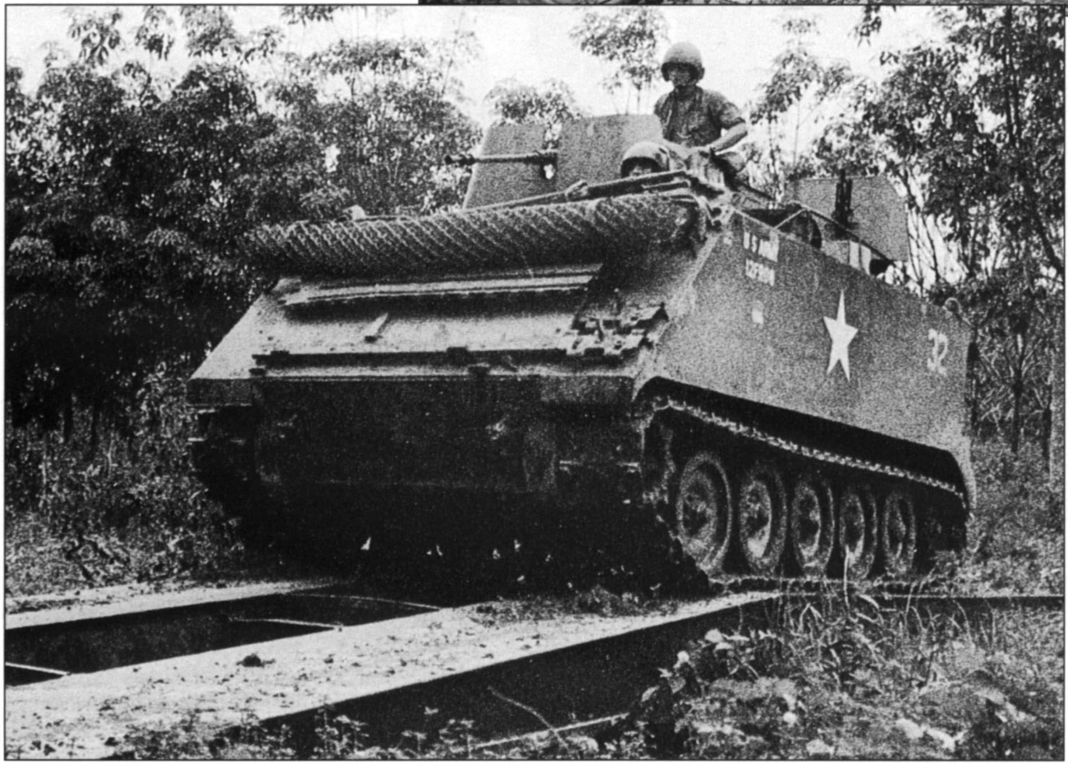
Normal U.S. Army practice in South Vietnam was that the vehicle commander always rode in the .50 caliber machine gun position. For all ARVN M113 units and some U.S. Army units, the vehicle commander rode in the rear compartment. The M2 Heavy Barrel (HB) .50 caliber machine guns mounted on most M113s during the Vietnam War was an air-cooled weapon that first entered U.S. Army service in 1933. The weapon's rate of fire is about 450 to 500 rounds per minute. The effective range of the weapon is roughly 2,500 yards.



Because of the danger land mines posed to the thinly armored M113s in Vietnam, some M113 drivers of the U.S. Army 25th Infantry Division had their driver's controls extended to the outside of the vehicle so they could control the vehicle while sitting in the driver's hatch position. They knew from experience if an M113 ran over a mine, it was usually the driver who was killed.

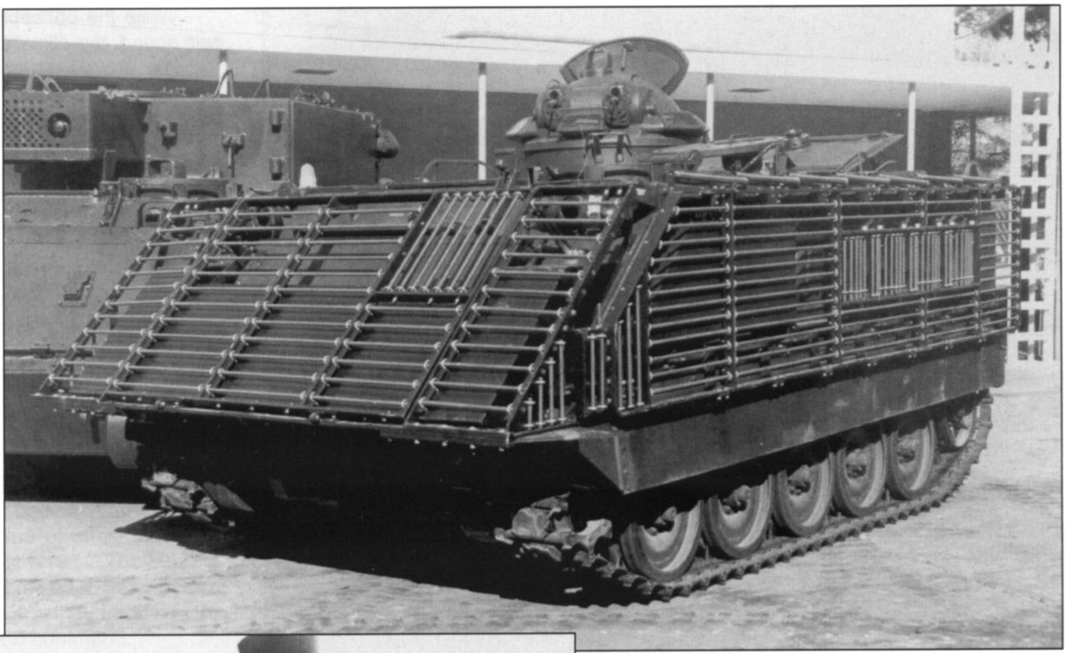


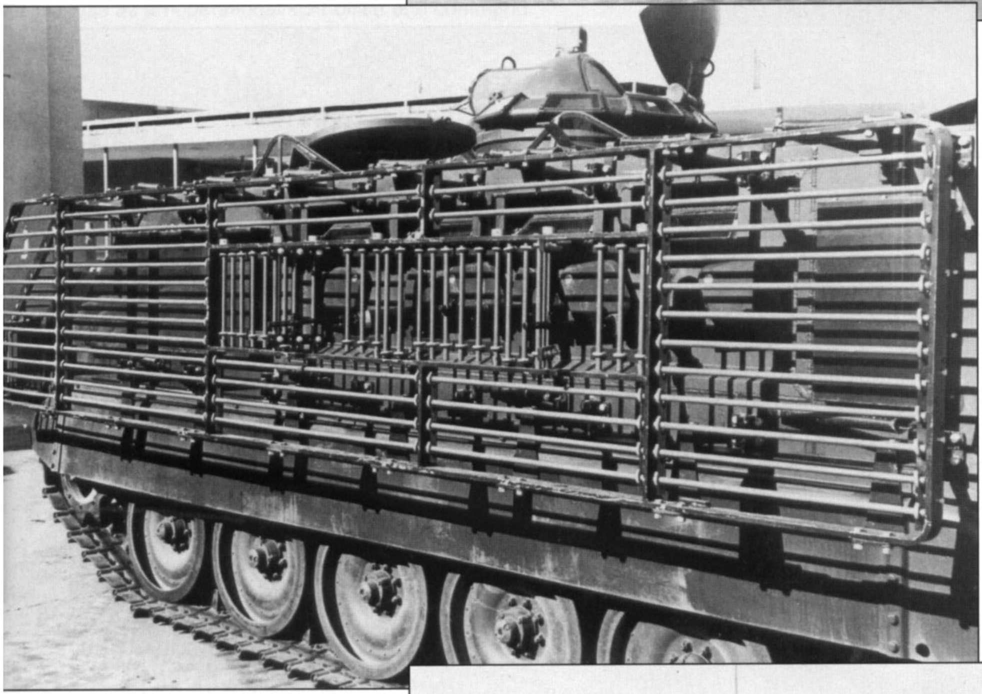
The RPGs used by the Viet Cong and North Vietnam Army units were a formidable threat to the M113. Using a hollow-charge warhead, the RPG could penetrate the thickest armor as long as it struck at or near normal incidence (straight-on) and detonated at the proper stand-off distance. This is an ACAV of the 9th Infantry Division that took a RPG hit. Visible is both the penetration hole of the RPG as well as the characteristic spalling effect of the weapon when it struck armor plate.



To protect their M113s in battle from the very deadly effects of RPG rounds, some American and ARVN units mounted various types of thin metal sheeting on the sides of their vehicles to help predetonate the RPG round before it struck the actual vehicle's hull. When parked in a nighttime defensive position, the crews of many M113s (as well as tanks) in South Vietnam would emplace chain link fencing material around their vehicles to predetonate any RPG rounds sent in their direction by the VC or NVA. Shown on the front of this ACAV is the rolled chain link fencing material used by many crews.

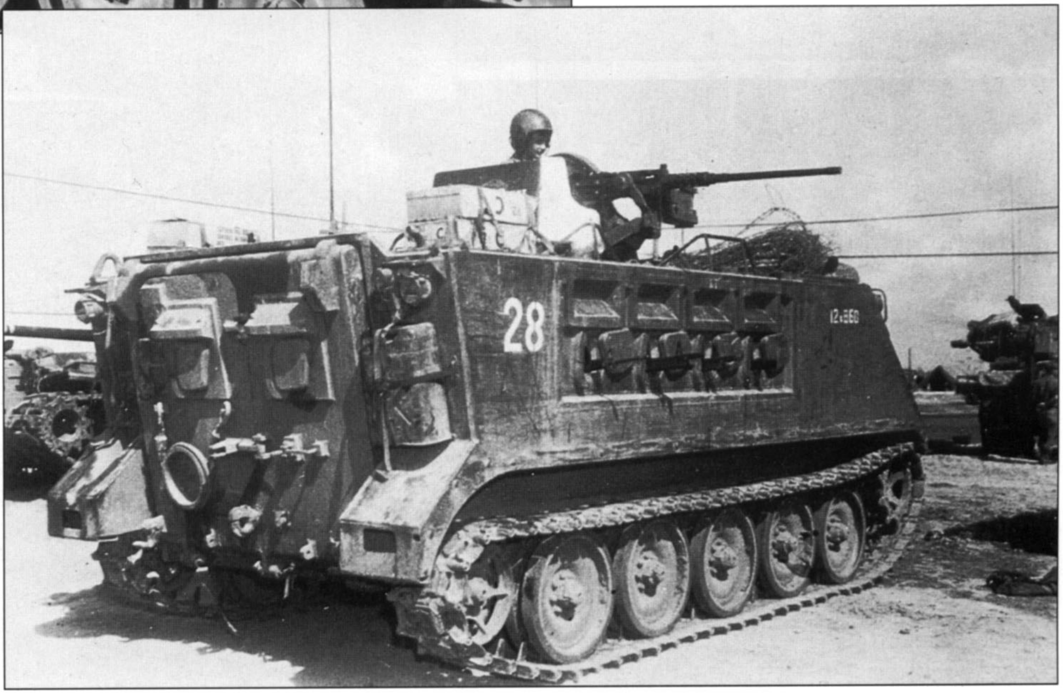
FMC and the U.S. Army had tried a number of countermeasures to stop RPG rounds. One attempt had been the development of bar stand-off armor kit, as seen here in an FMC factory photo. A small number of such kits were installed on M113s of the 10th Armored Cavalry Regiment in South Vietnam. Because the unit did not see any significant combat action at the time it proved difficult to evaluate the effectiveness of the bar armor. Notice that this vehicle is also fitted with hull-mounted firing ports as well as an FMC-designed and built M74 turret as found on many ARVN M113s.

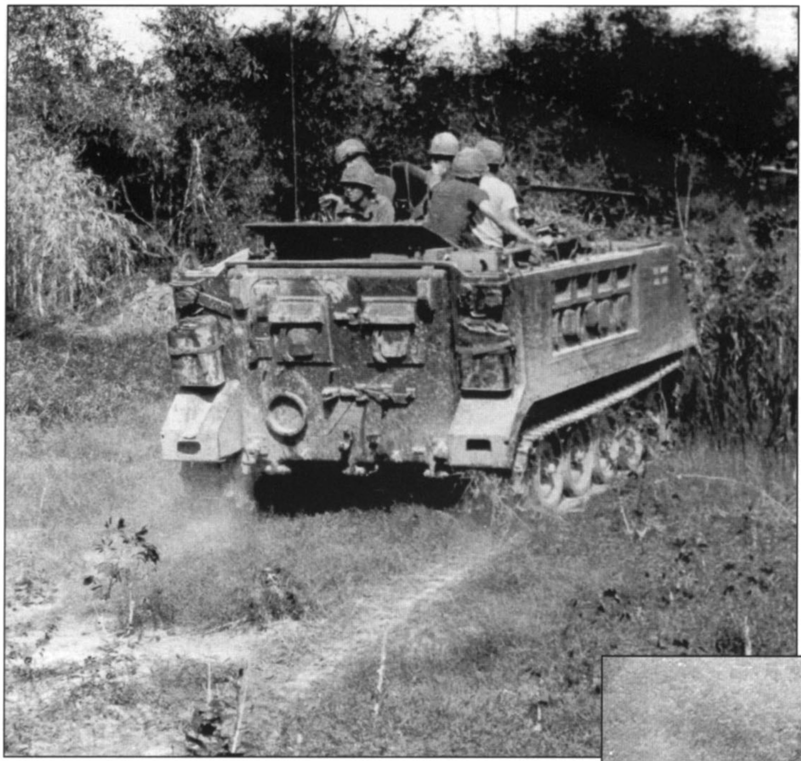




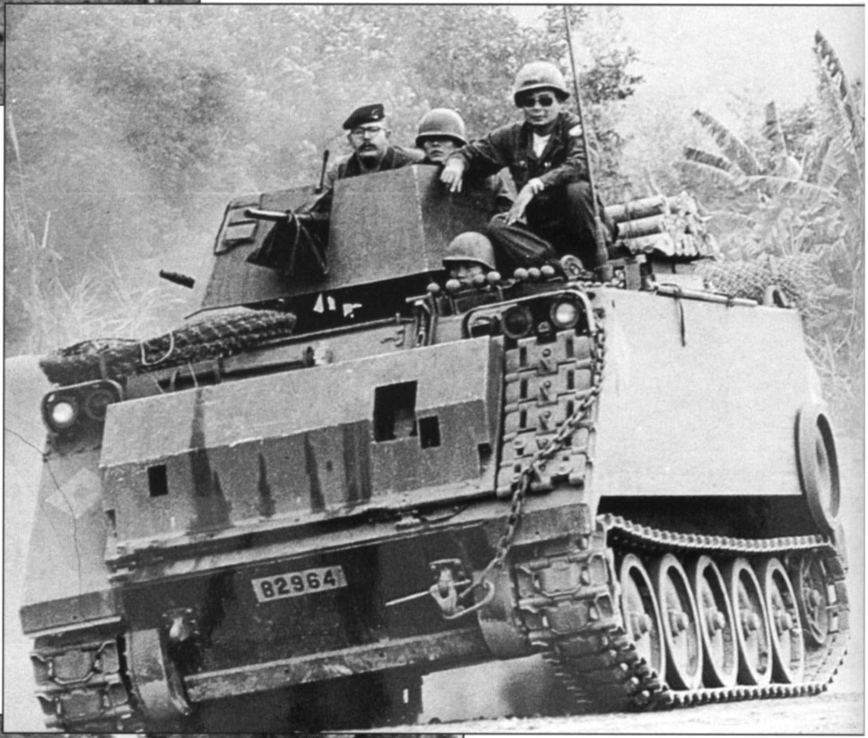
Visible in this photo is a side view of the bar armor on an M113. Notice the hull-mounted firing ports. The one thing that was proved during the testing period in South Vietnam was that the bar armor slowed down vehicles so equipped. Bar armor also proved to be easily damaged when struck by brush and other obstacles. The U.S. Army decided that bar armor was inadequate and ended the program.

Seen in this Vietnam War photo is an XM734, an M113 modified by the addition of firing ports on either side of the vehicle and also in the rear ramp. The XM734 was developed by FMC in response to a U.S. Army request. Six of these modified M113s tested in South Vietnam. Each XM734 had a total of ten firing ports, four on each side and two in the rear. Above each firing port was an observation vision block.

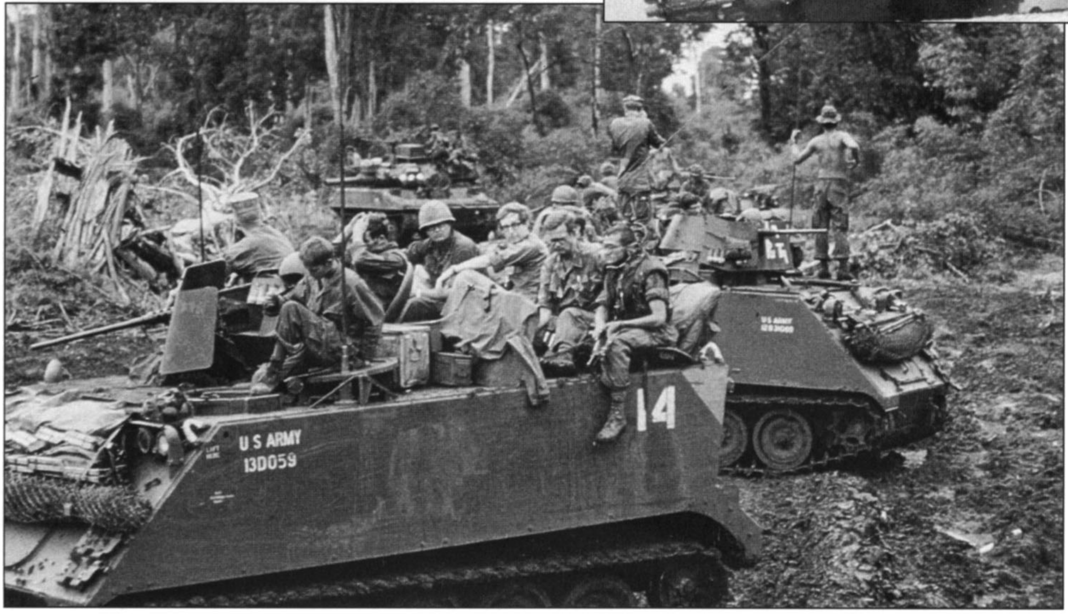




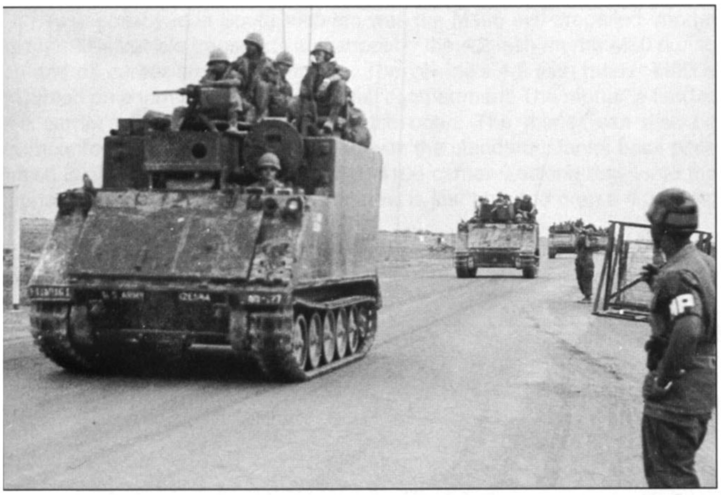
While the concept of providing the M113 with hull firing ports was sound, the climate, the terrain, and the enemy threat in South Vietnam proved the concept unworkable. The rubber seals in the gun-ports quickly rotted away in the humid climate condition of Vietnam and the vehicle quickly began to leak all the time. The troops themselves continued to ride and fire from the top of their vehicles, both due to fear of mines and the horrible heat that built up inside the armored hull of the M113s. The U.S. Army decided that the hull firing ports weren't needed and ended the program. This XM734 is operating as a blocking force during "Operation Cedar Falls" in the Filhol Plantation by the Saigon River in January 1967.



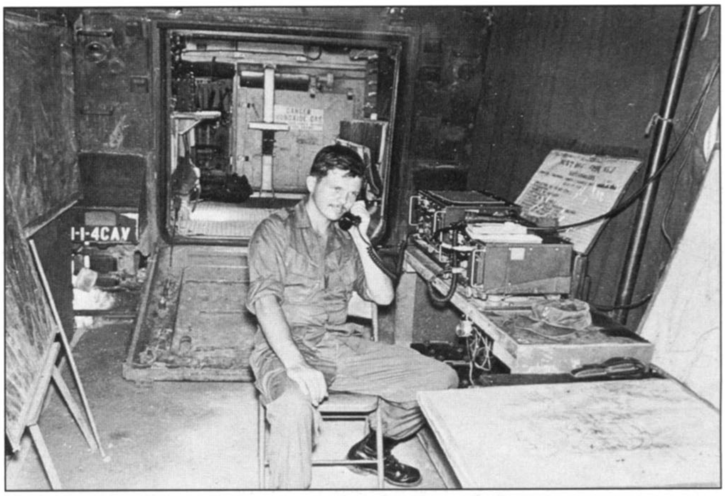
In 1969 the U.S. Army fielded a mine protection kit composed of titanium armor plates to be fitted to the bottom of M113 hulls. Also included in this upgrade was the rerouting of fuel lines inside the vehicle. Because of the extra armor protection added to the M113s in Vietnam, the vehicle's amphibious capability started to disappear. To remedy this problem, styrofoam flotation pads were affixed to the front hull plates and the trim vanes of M113s. This vehicle pictured has only the flotation pad affixed to its trim vane and not on its front hull.



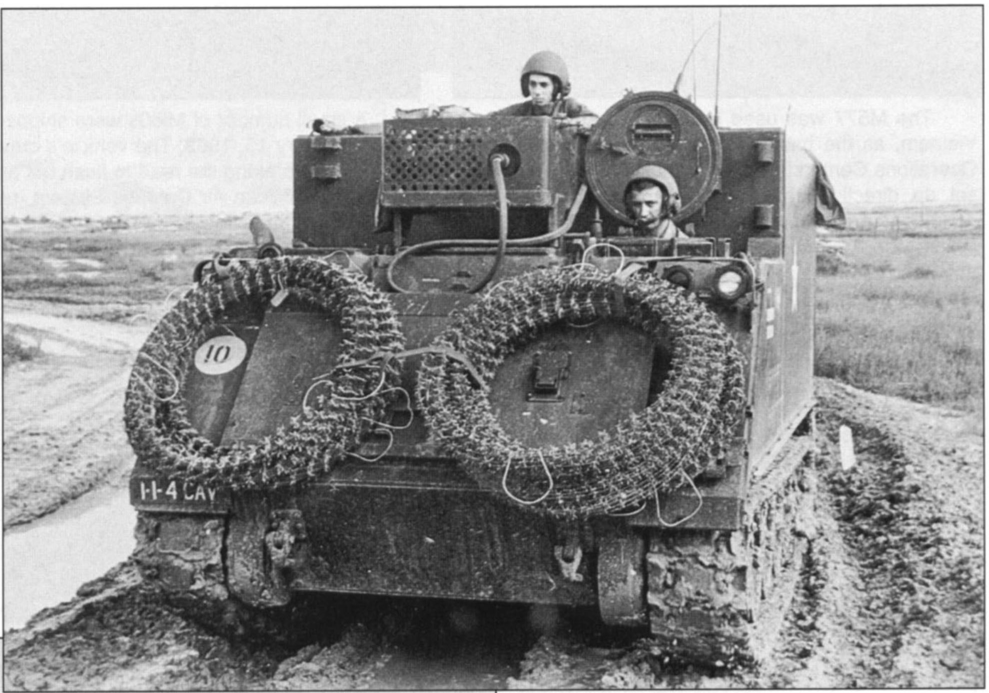
A unit of ACAVs is assumed a defensive formation while stopped on jungle road. Going into action, the typical M113 (ACAV) in South Vietnam carried almost 3,500 rounds of M2 .50 caliber machine-gun ammunition, 8,500 rounds of M60 7.62 machine-gun ammunition, 5,000 founds of ammo for the onboard M16 rifles, 144 40mm grenades for the M174 grenade launchers, plus an assortment of mines like the Claymore anti-personnel mine.



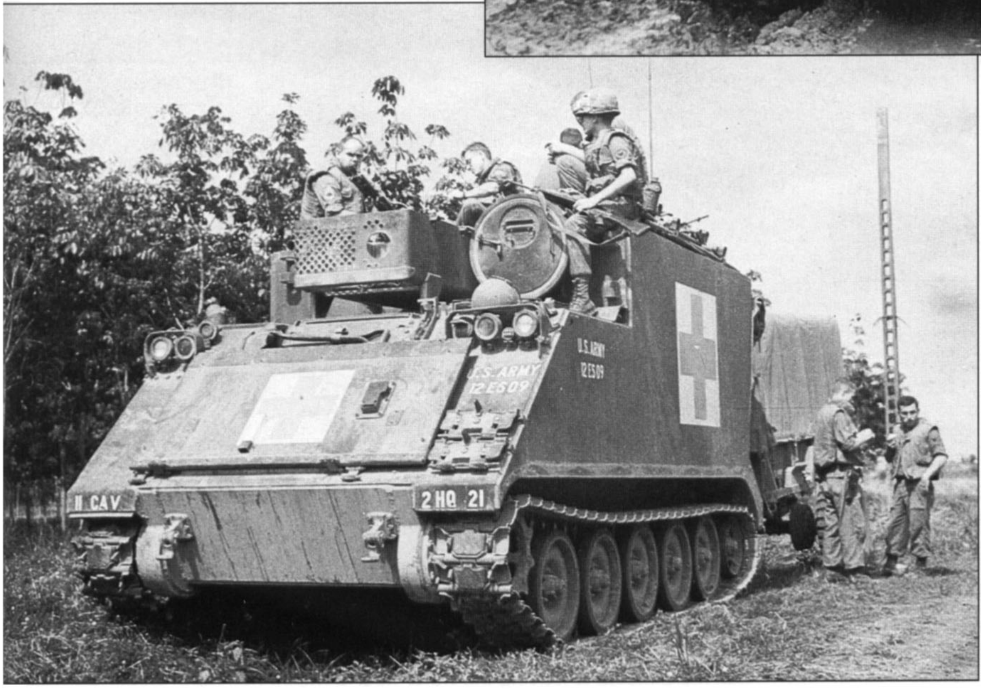
Having been designed as a multi-purpose vehicle, FMC's M113 was adapted for a number of different roles. One of those variants in South Vietnam is the M577 armored command post vehicle. The M577 is basically a standard M113 with the rear compartment raised to allow officers to stand up straight to better read large maps and control their troops. In this role, the vehicle acts as an operational staff office and command.



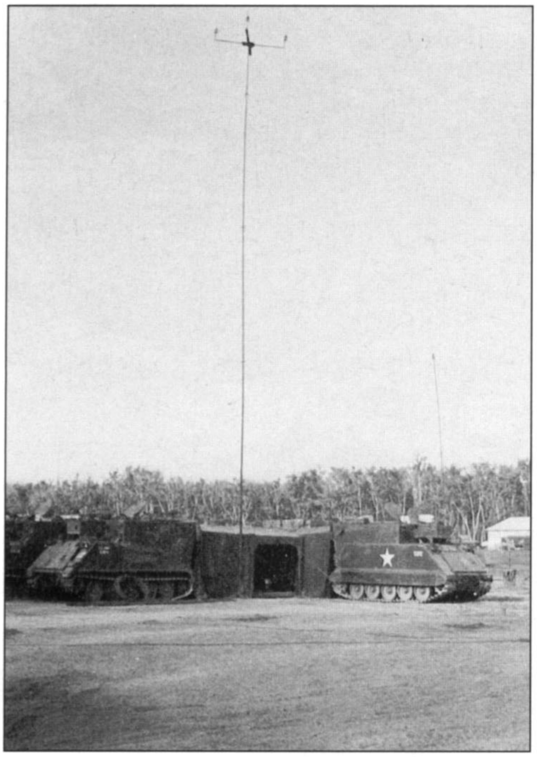
The M577 carried a large tent extension that can be erected at the rear of the vehicle to provide more space, if needed. Pictured in South Vietnam is the interior of an M577 with its onboard tent extension set up. The M577 can accommodate a four-man operational team in addition to a vehicle driver.



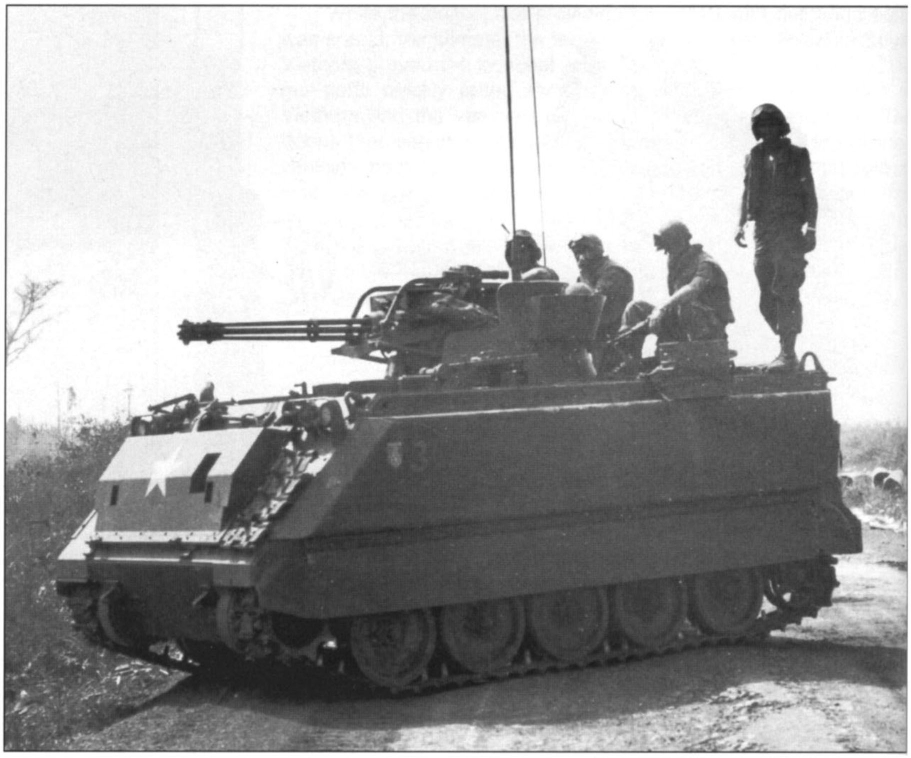
The M577 was equipped with an externally mounted gasoline engine mounted on the front superstructure of the vehicle. This externally mounted gasoline engine drove a 4.2 KW, 150 amp, 28 volt DC auxiliary power unit which supplied power for light and command post operations. Map boards and radio gear permit within the M577 allowed independent functioning in the field.



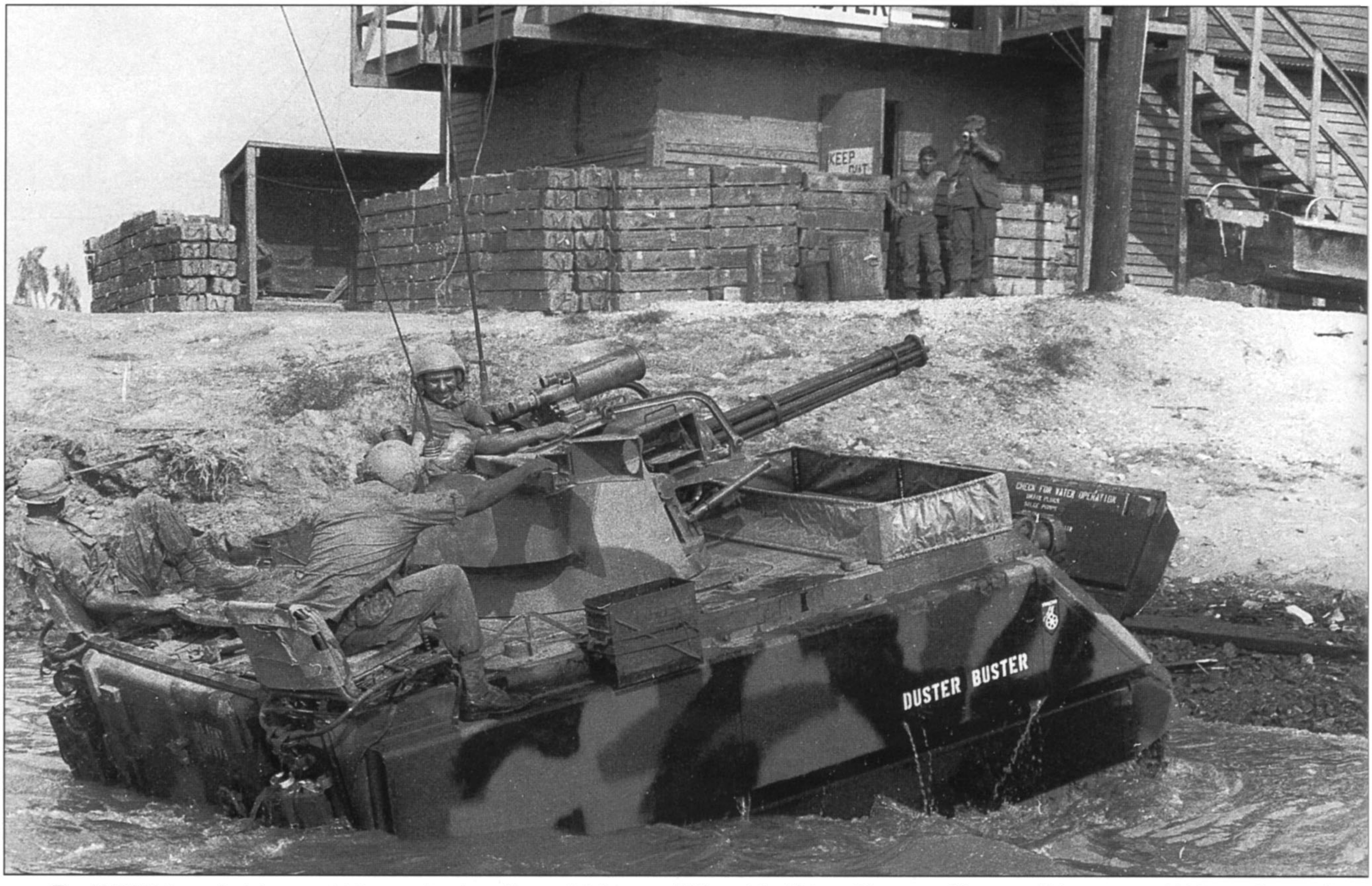
Because U.S Army medical evacuation helicopters were not always available to airlift wounded personnel out of combat areas and because wheeled ambulances could not always reach off road battlefield positions, it was necessary to develop a variant of the M577 that could be used as a field ambulance. There were field modification kits which allowed the mounting of litters inside the M577.



The M577 was used by the U.S. Army, in South Vietnam, as the basic vehicle for established Tactical Operations Centers (TOC). Normally these TOCs were set up directly behind the front lines of a combat operations area. Shown is a high level command post set up with a number of M577s. Notice the very large antenna.

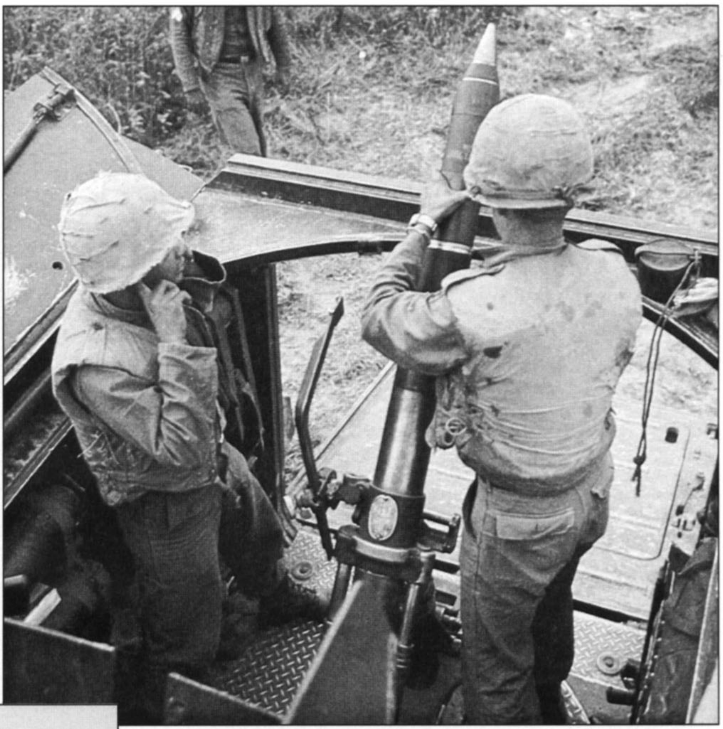


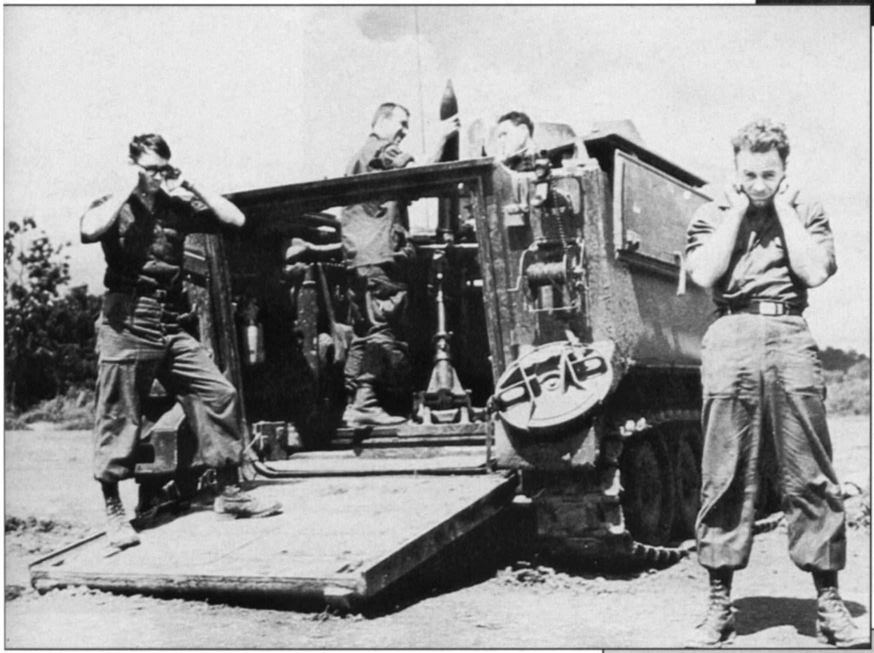
A small number of MI63s were shipped to Vietnam, this one is operating along Highway 13 on January 15, 1969. The vehicle's crew is using their Vulcan 20mm machine guns to fire into the brush along the road to flush out any enemy troops. Because of the additional weight of the M61 Vulcan Air Defense System turret mounted on an M113 chassis, the M163 was provided with additional flotation devices fitted on either side of the hull and on the vehicle's trim vane.



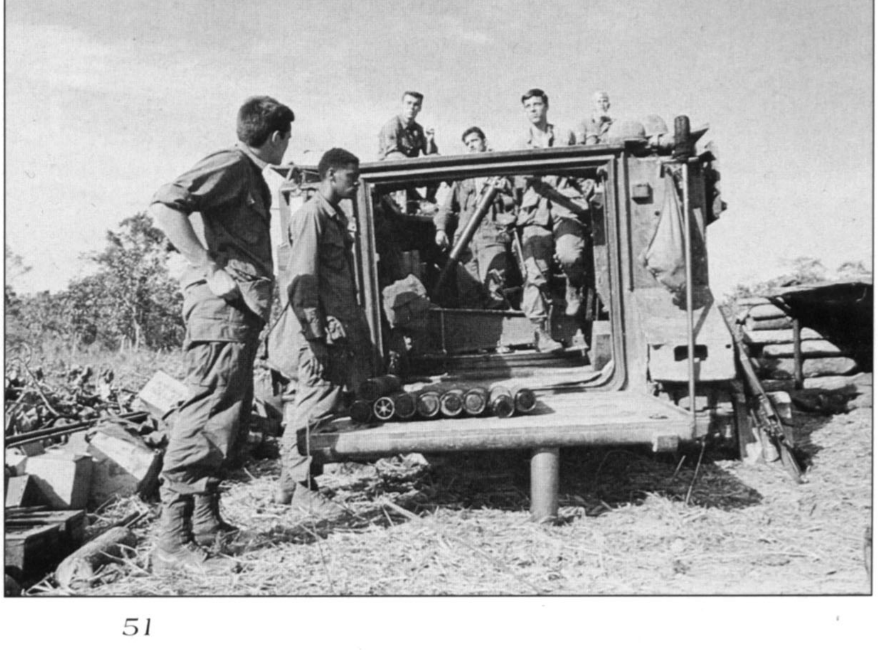
The M163 Vulcan air defense vehicle was developed to exploit the capabilities of the Vulcan 20mm machine gun. Firing at up to 3000 rounds per minute, the Vulcan is able to furnish effective low-level, mobile air defense to troops in the field. Since there was little threat from the air for U.S. Army units in South Vietnam, the M163 vehicles were normally used in convoy support duty. The M163 pictured is leaving the water near Dong Tam in April 1969.

Also employed in South Vietnam was the M106 self-propelled mortar carrier. This vehicle transports and supports the 4.2 inch mortar M30 during on and off carrier tactical operations. The vehicle's 4.2 inch mortar M30 is mounted on a turntable in the personnel compartment. The mortar is fired to the carrier's rear with the mortar hatch open. The mortar can also be dismounted from the vehicle and fired with the standard infantry base plate which is stowed on the outside of the M106 carrier. Looking down into the mortar compartment of an M106 the crew is just about to drop a 4.2 round into the mortar.

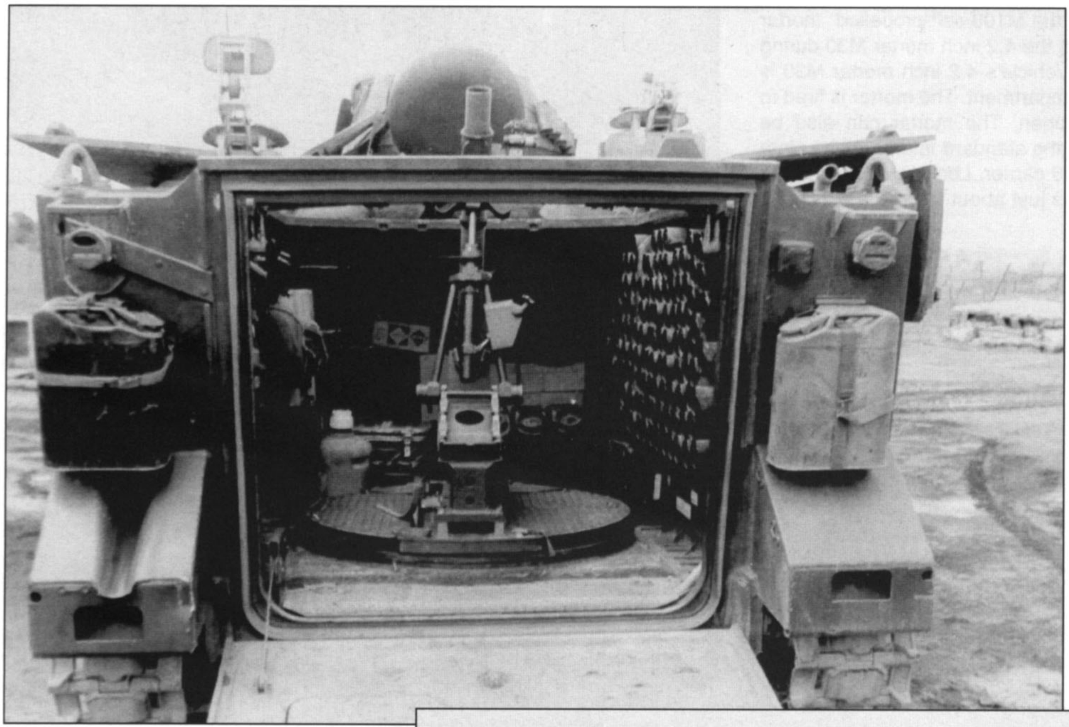




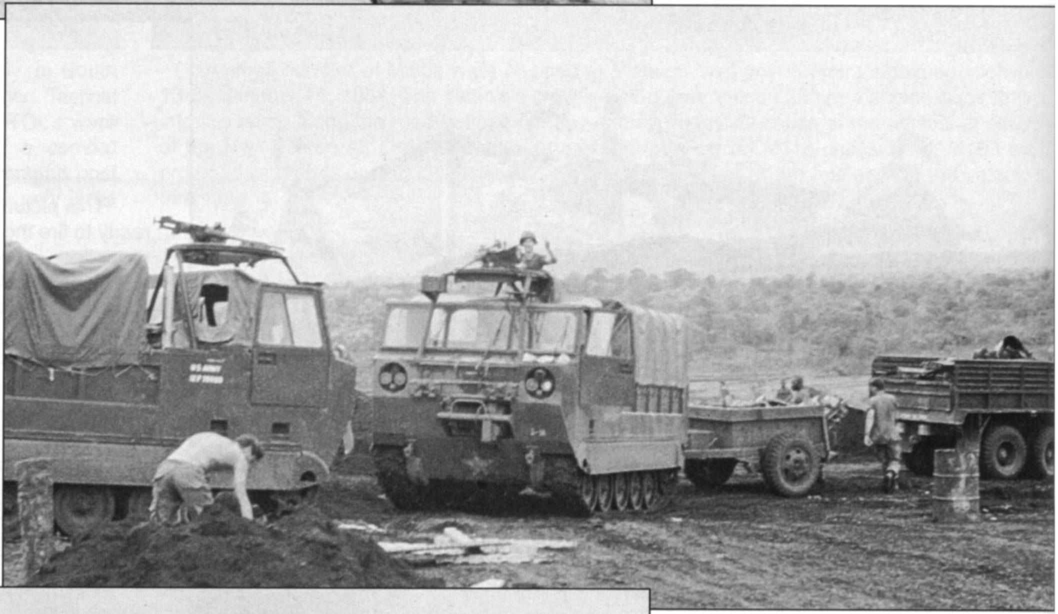
This picture shows another view of a crew of an M106 ready to fire their onboard weapon. The M106 armored self-propelled mortar carrier retaining the basic box-like silhouette of the M113. However, the floor of the vehicle contained a reinforced beam to disperse the firing forces of the onboard mortar. The M106 carried 88 rounds of mortar ammunition to permit sustained operations away from resupply forces. Additionally, an M2 .50 caliber machine gun was carried on the commander's cupola. A two-part circular hatch cover above the rear-firing mortar allowed the crew to traverse the weapon within the vehicle.



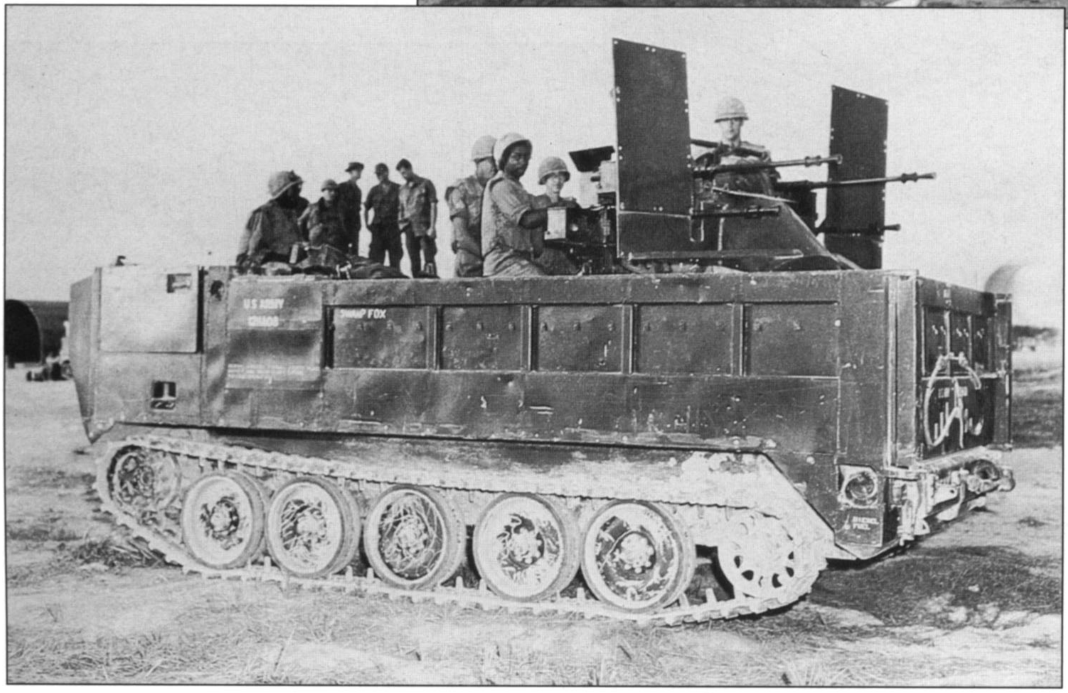
The M125 armored self-propelled mortar vehicle (a derivative of the M113 family) which also saw service in Vietnam carried an 81mm mortar that could be traversed 360 degrees and fired from within the vehicle, or be removed and be fired from outside the vehicle. The firing hatch consisted of an enlarged three-piece door assembly that yields adequate clearance for firing the weapon. The vehicle carried 114 rounds of ammunition for the mortar.



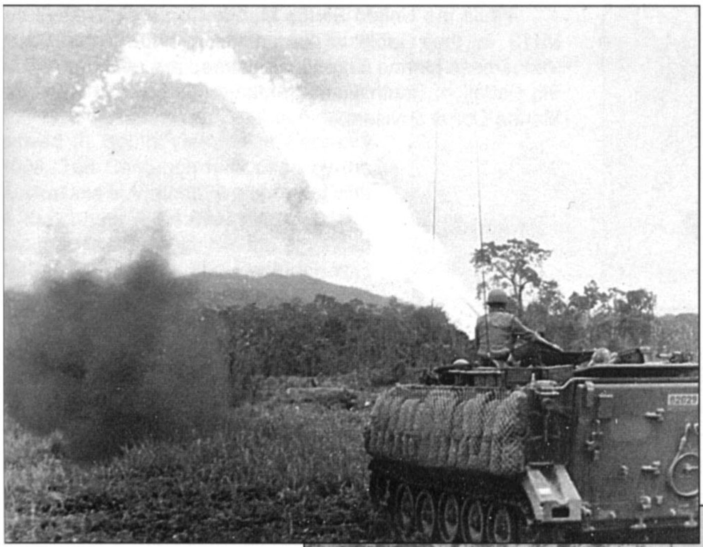
Within the M125 self-propelled mortar carrier the 81mm mortar is mounted on a turntable in the vehicle crew compartment. The mortar can be fired in any azimuth from the turntable. It can also be dismounted from the carrier and ground fired with the use of a mortar baseplate which is stowed in the carrier. This picture shows a close-up view of the rear compartment of an M125 as well as the mortar and internal stowage.



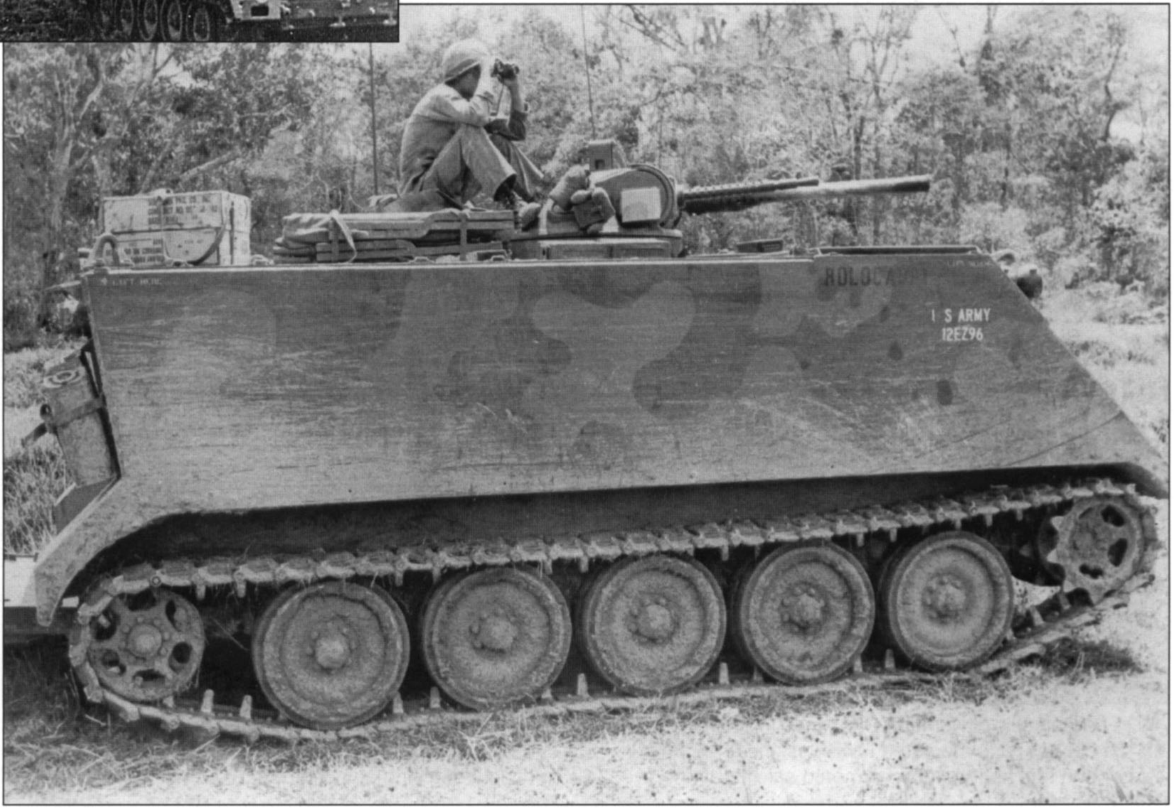
Another vehicle based on the M113 family of vehicles that saw widespread use in Vietnam was the M548. Using a high percentage of the suspension and powertrain components common to the M113, the M548 was designed to transport cargo over adverse terrain, across inland water obstacles and at high speeds on improved roads. The M548 carried a six-ton payload and had seating for four people in its cab. The standard vehicle was also equipped with a vinyl-coated fabric cab cover and had provisions for mounting a .50 caliber machine gun.



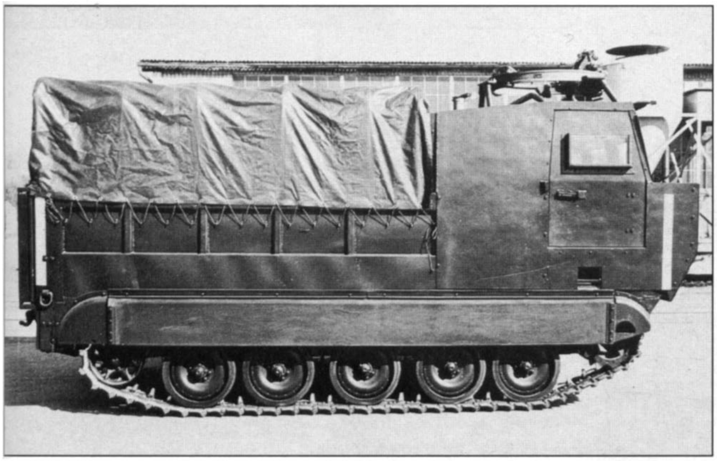
Normally the M548 unarmored cargo carrier was used strictly in logistic support missions. However, during the Vietnam War at least one U.S. Army unit decided to turn a M548 into a weapons carrier. The M548 pictured has been fitted with quad .50 caliber machine guns in an armored mount.



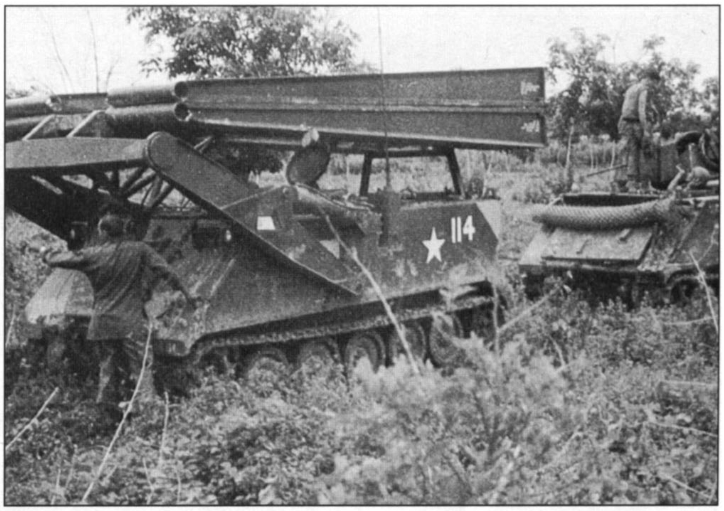
An M113 vehicle developed for use in South Vietnam was the M132 self-propelled flame-thrower. Instead of the standard commander cupola as found on most M113s, the M132 had a small one-man enclosed turret fitted with a flame-gun (plus machine gun) and 200 gallons of fuel stored in the troop compartment. Pictured in South Vietnam is an M132 letting loose a long steam of napalm in the enemy's direction.



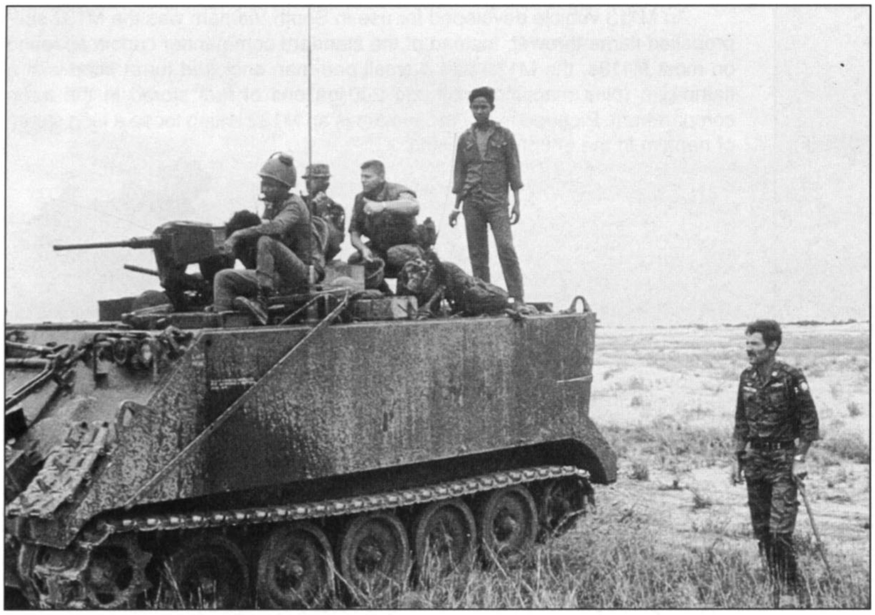
Used by both American and ARVN units, the M132 self-propelled flame-thrower was nicknamed the "Zippo" after the well-known cigarette lighter. The first M132 arrived in Vietnam in August 1962, but saw little use. In December 1964, the 1st Armored Cavalry got two of them for testing. They were so successful in action that the field testing team recommended that four M132's plus two M113 service units be issued to each regiment.



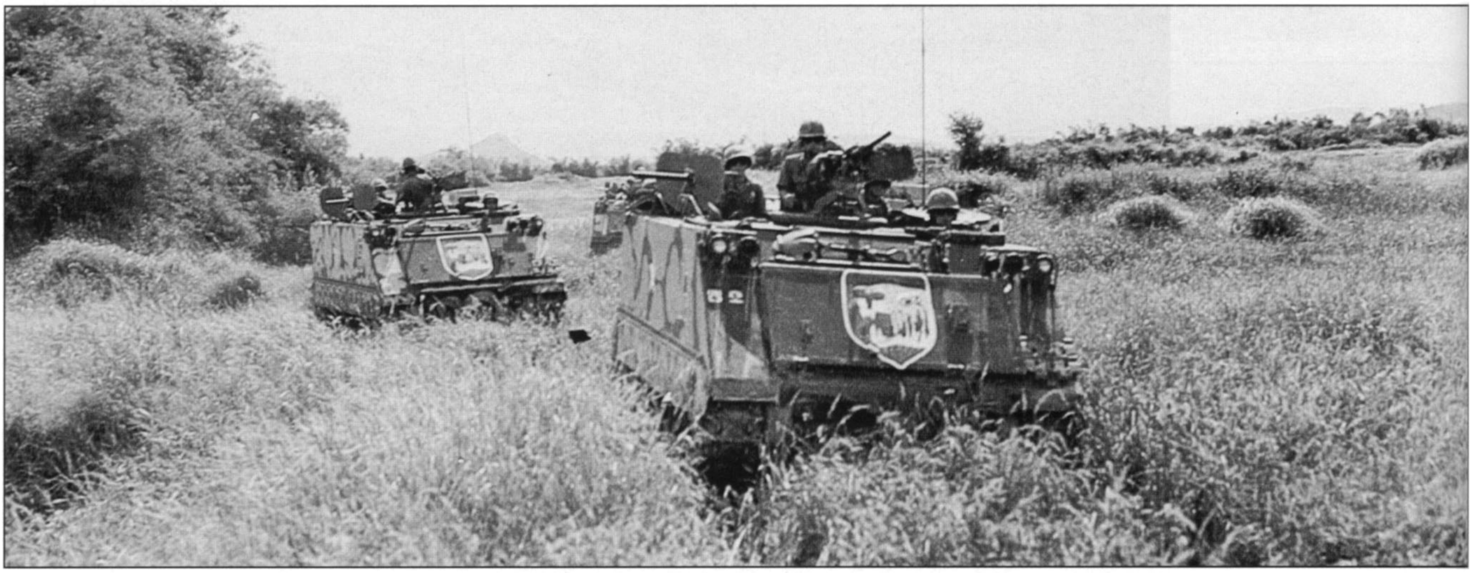
A few M548 vehicles modified in the United States by FMC were sent to Vietnam as flame-thrower resupply vehicles to support units equipped with the M132 flame-thrower vehicle in forward combat areas. For added combat protection, the vehicle's cargo bay and crew cab were armor protected. The M548 flame-thrower resupply vehicle was designed to mix and transfer thickened fuel (jellied gasoline) and compressed air to the M132 when needed.



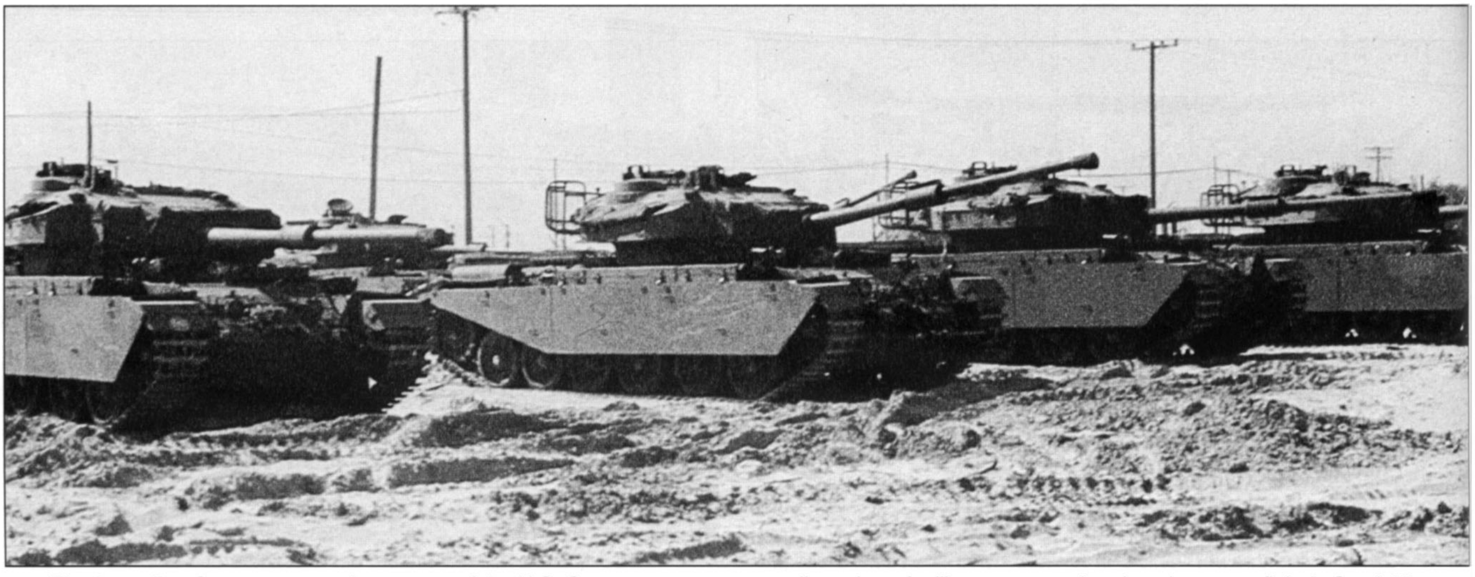
To help M113 equipped units cross the numerous streams and small dikes that criss-crossed much of southern South Vietnam, the U.S. Army had built a small number of M113s equipped with light assault bridges. The aluminum bridging unit had a span of 30 feet. Twenty-nine of these units were built for use in Vietnam.



While the United States Marine Corps didn't have the M113 in their table of organization (TOE), the South Vietnamese Marine Corps did. Pictured are members of the 9th Battalion, South Vietnam Marine Corps, and their U.S. Marine Corps advisors.

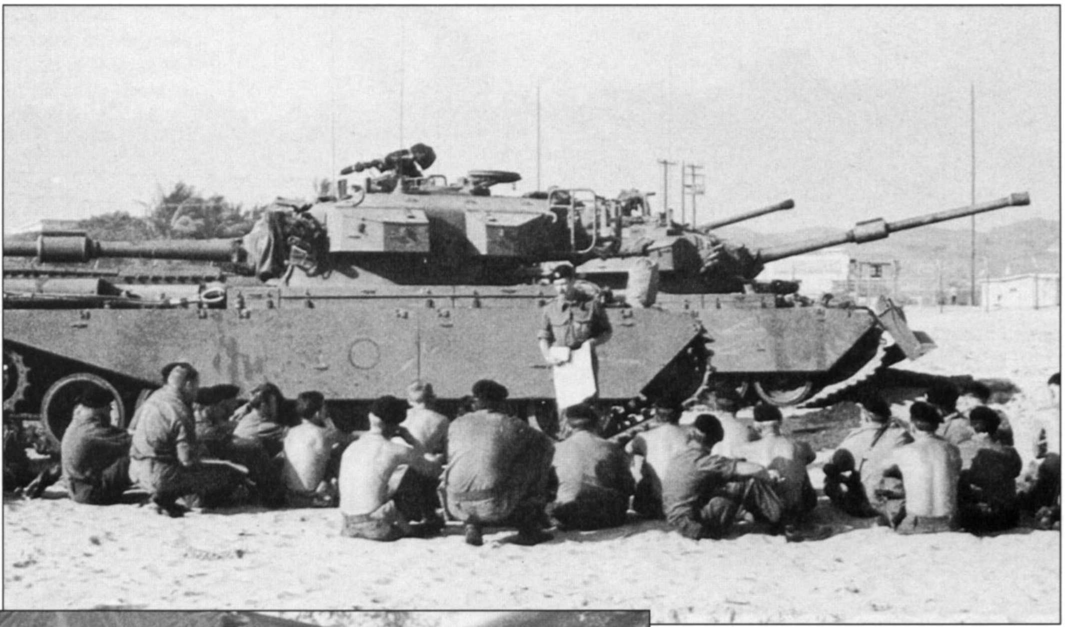


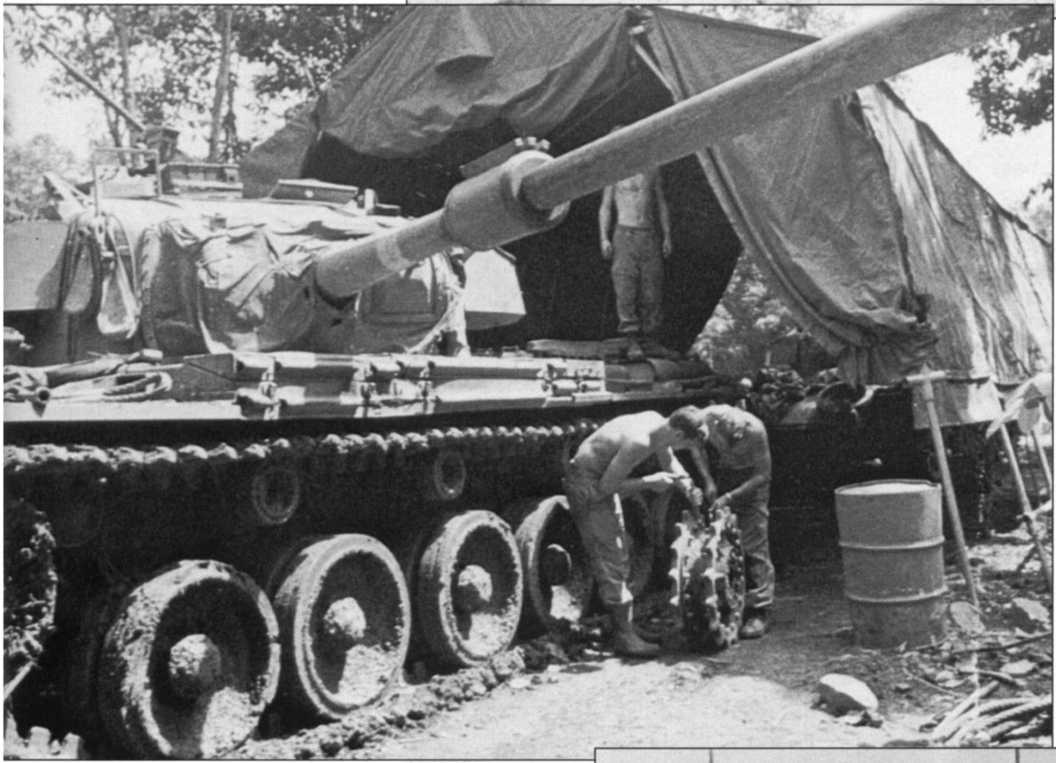
The Republic of Korea (ROK) Army units sent to South Vietnam acquired a number of M113s on permanent loan from the U.S. Army. The Korean Army M113s did not have the same FMC-designed and built gun shield kits as applied to U.S. Army M113s. Instead, they did without the gun shield for the .50 caliber and had heart-shaped armored shields for the two .30 caliber light machine guns fired from the rear personnel compartment..



The Australian Government, at the request of the U.S. Government, sent a small number of military personnel and equipment to fight in South Vietnam. Among the Australian military units sent to Vietnam was a variety of armored vehicles including twenty-six British built Centurion tanks, some of which are pictured here on their arrival in South Vietnam. Besides the gun-armed Centurion tanks the Australians also sent two Centurion-based bridge layers, two Centurion-based tankdozers, and two Centurion-based armored recovery vehicles.

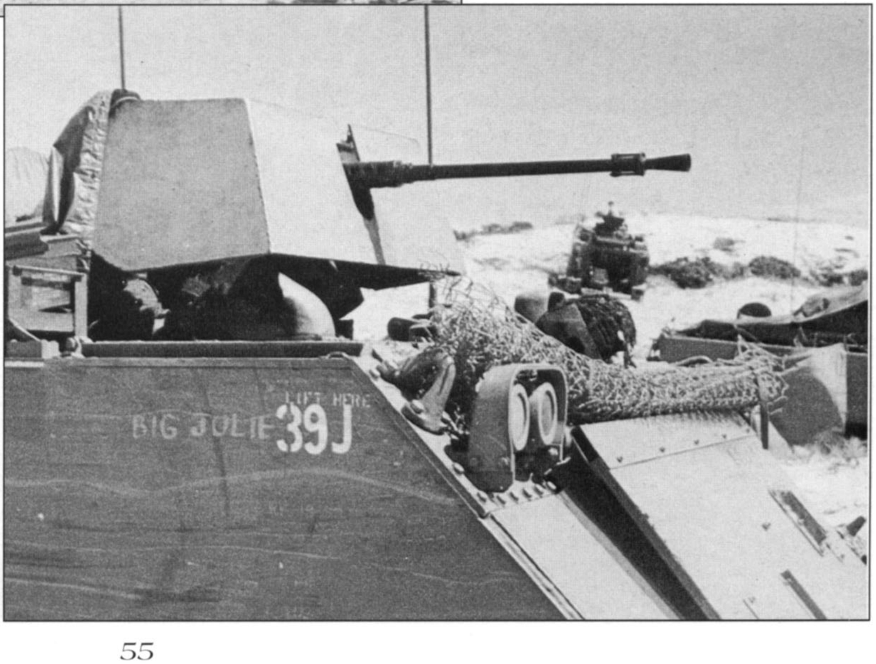
Pictured are troops of the 1st Australian Armoured Regiment in front of their Centurion tanks receiving a briefing on an upcoming operation. The first of the Australian Centurion tanks arrived in South Vietnam in February 1968. The Centurion tank used by the Australians in Vietnam were armed with a 20 pounder (83.4 mm) main gun and two machine guns. Unlike the American M48A3 Patton tank, the Centurion was powered by a large Rolls-Royce, water-cooled, gasoline engine. Because of the shorter range of gasoline powered tanks (125 miles), the Australians added an auxiliary 100 gallon fuel tank at the rear of the vehicle.

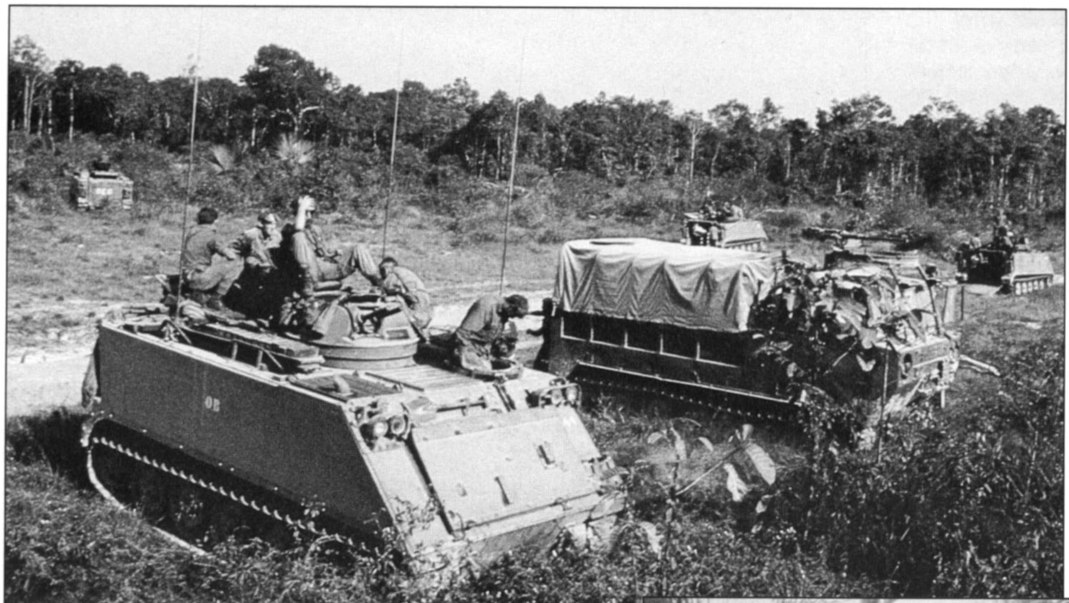




Pictured at a workshop area in South Vietnam is an Australian Centurion tank having its rear idler wheel being repaired. Combat experience in Vietnam quickly showed that the Centurion's standard bazooka plates, track guards, and other components on the outside of the vehicles were not up to jungle busting. Soon all Australian Centurion tanks would either loose or get rid of any outside component that could be knocked off in the field. Like the U.S. Army armored forces in Vietnam, the biggest problem keeping their tanks operational was the lack of spare parts.

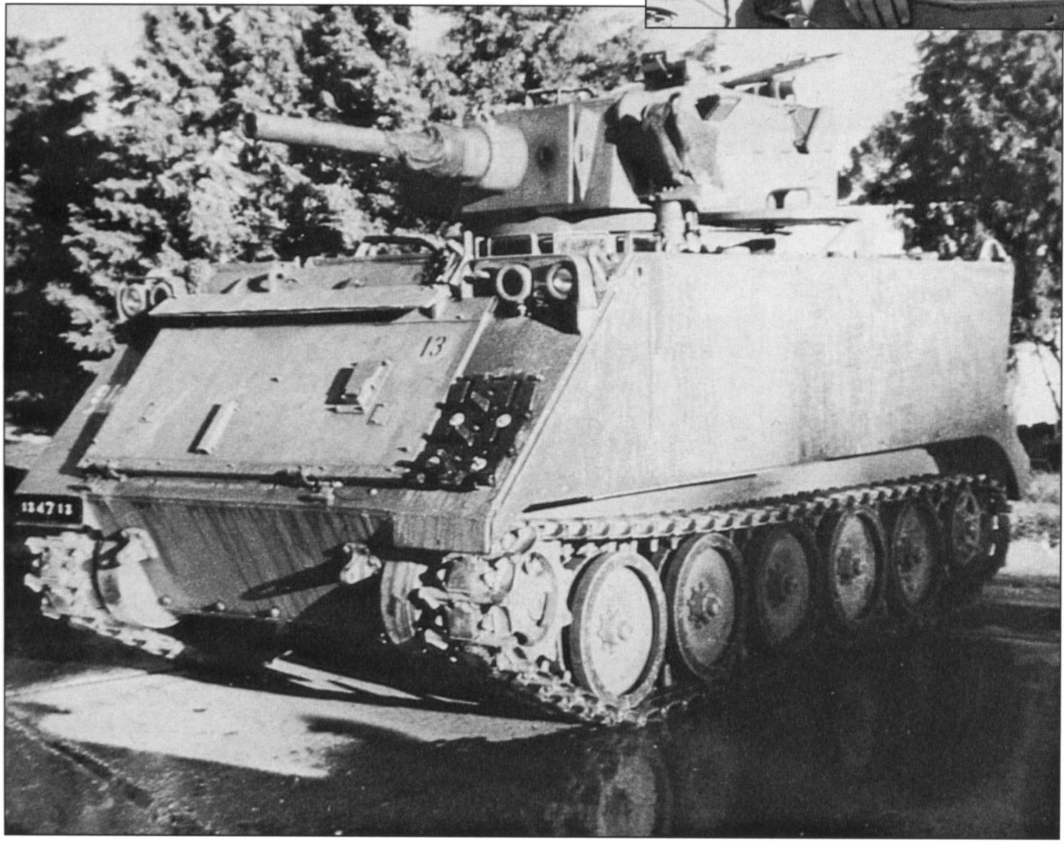
The Australian troops sent to South Vietnam were also equipped with a number of M113 variants. These would include the standard armored personnel carrier M113A1, the M577A1 commander post vehicle, the M125 mortar carrier, and the M113A1 fitter's vehicle. Upon arrival in South Vietnam many of the Australian M113s were provided with locally-made gun shields as pictured. Australian M113s seemed not to have been fitted with any additional gun shields for troops firing over the top of the rear troop compartment.





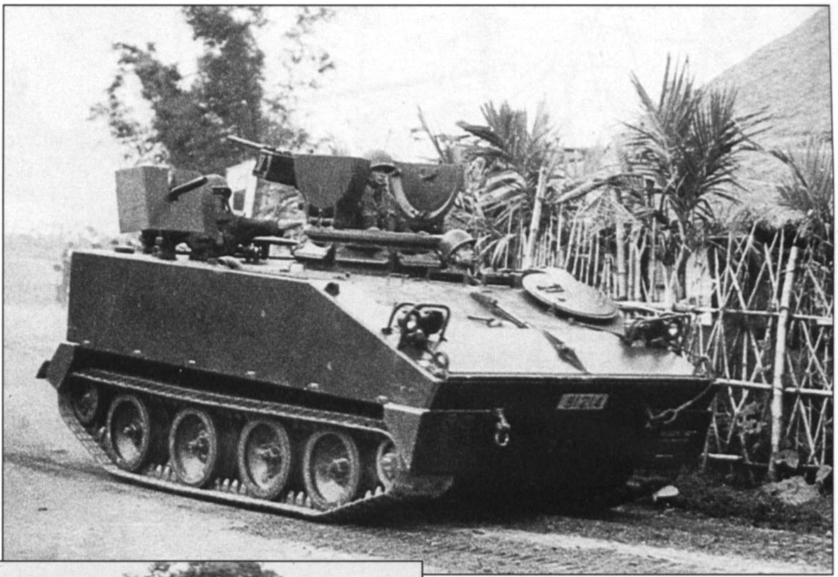
The Australian armored units in South Vietnam seemed to be much more concerned about overhead protection for their M113 crews than the U.S Army. At first the Australians tried using the M74 turret as found on many ARVN M113s. Eventually, the Australians decided to mount a T50 Cadillac Gage machine gun turret on most of their M113s in Vietnam. An Australian M113 equipped with the Cadillac Gage T50 turret is seen in South Vietnam parked next to an U.S. Army M548.

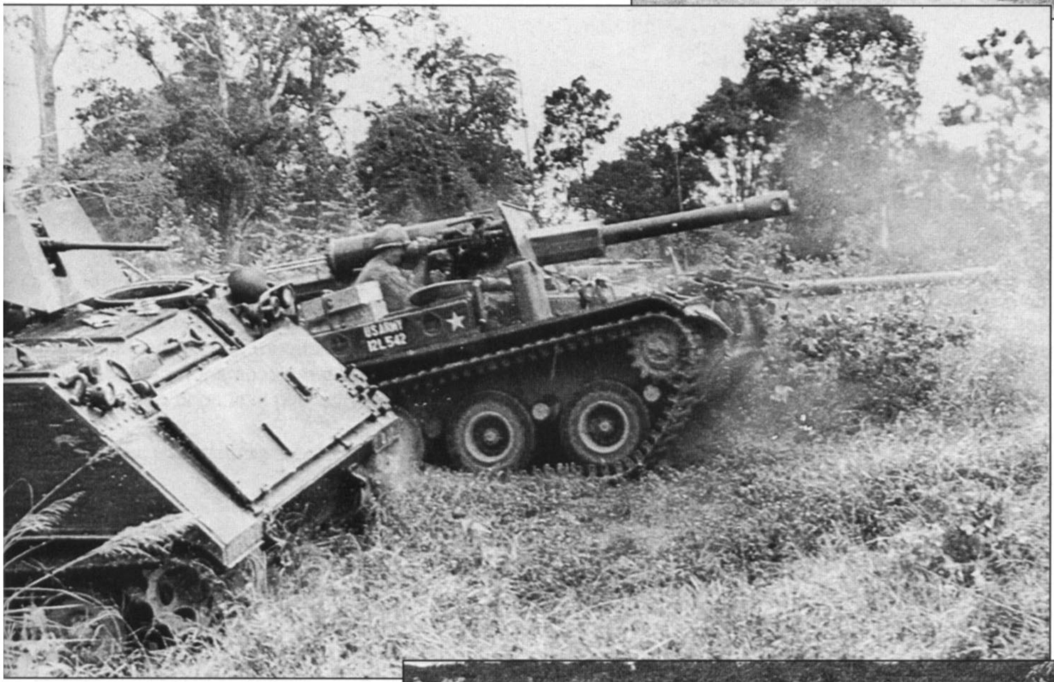
Pictured deep in a South Vietnamese jungle the commander of an Australian M113 is looking out from his Cadillac Gage machine gun turret. The Cadillac Gage Company-built turrets were armed either with twin .30 caliber machine guns or one .30 caliber and one .50 caliber machine gun. Combat use showed that the turrets were too small to operate two machine guns together. Normally, either one or another weapon would be mounted on top of turret roof for ease of operation.



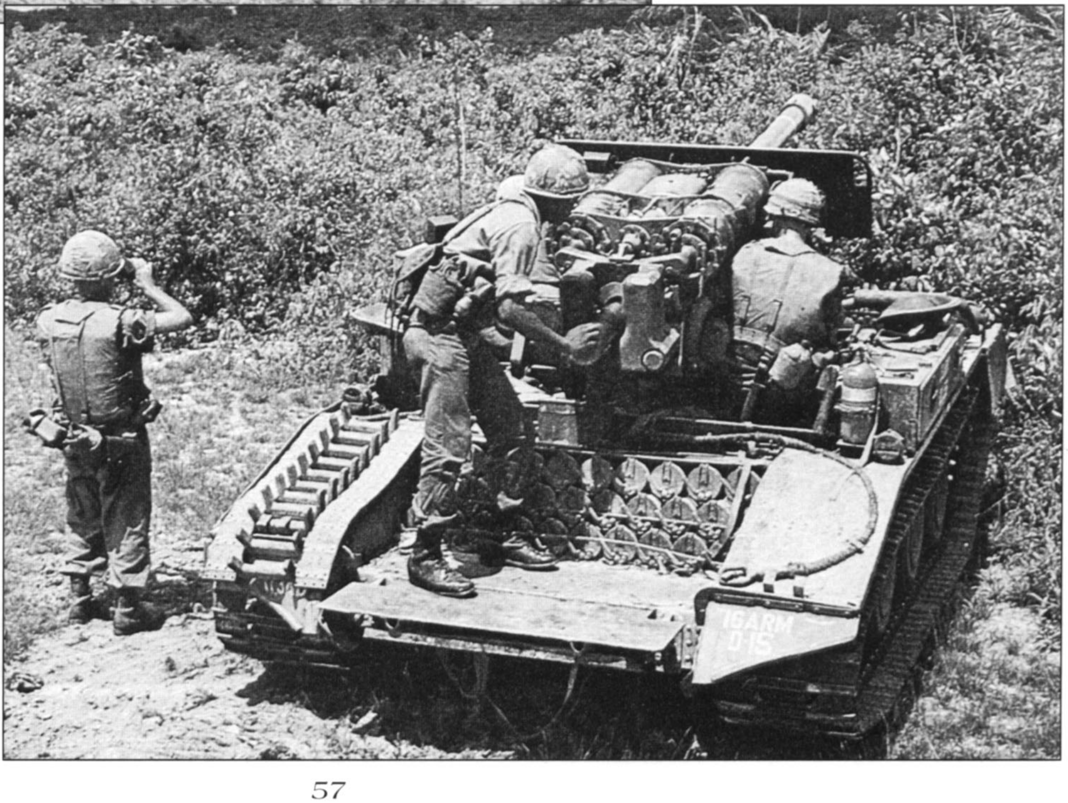
The strangest M113 type vehicle deployed by the Australian Army in Vietnam were six M113A1 fire support vehicles (FSVs). Basically, the Australian Army took the turret off old British-made Saladin armored cars and mounted them on top of an M113, while increasing the vehicle's firepower with a 76mm cannon, as found in the Saladin turret. The vehicle, as one could guess, was very top-heavy and very unstable in any type of water environment.

The M114 reconnaissance vehicle was supplied to the ARVN at the beginning of American involvement in Vietnam. Unfortunately, due to a number of serious design problems the M114 could not move cross-country and had difficulty entering or leaving waterways. The M114 was quickly taken out of ARVN service and replaced with the much more effective M113. Notice on this ARVN M114 the gun shield for the onboard .30 caliber machine gun. This type of shield could also be found on many ARVN M113s.

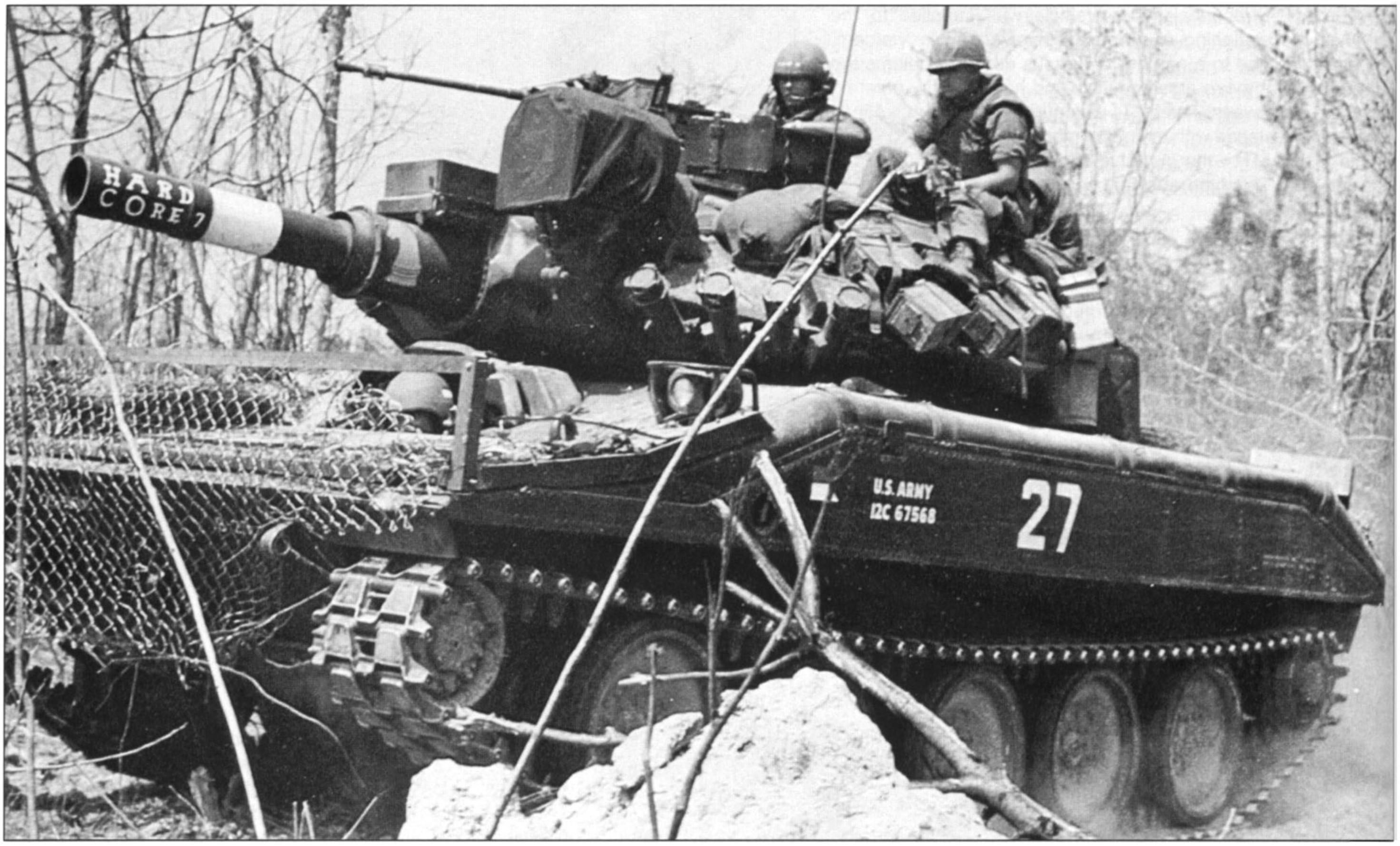




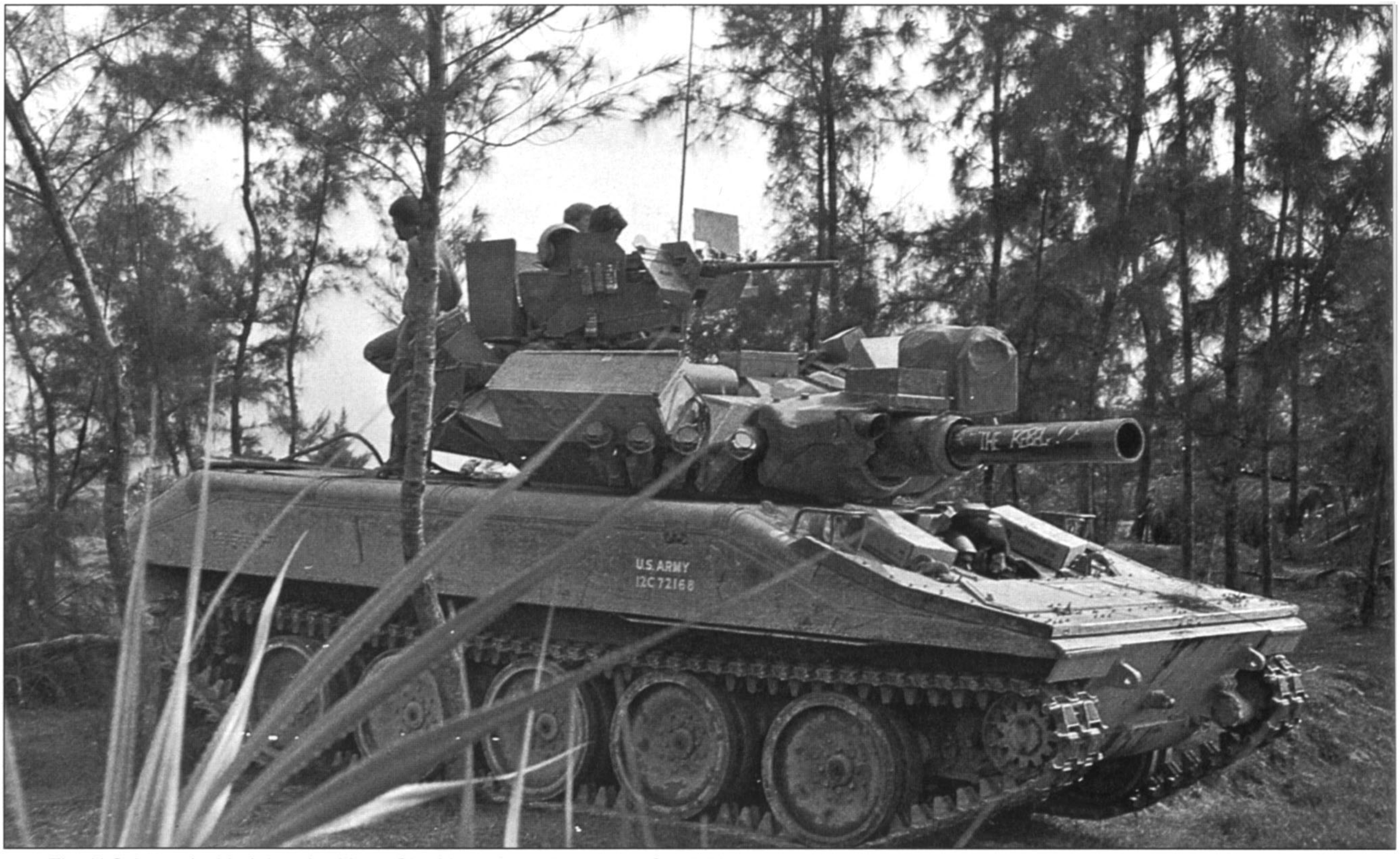
Another American designed and built vehicle that proved to be a failure in combat use in Vietnam was the M56 90mm self-propelled antitank gun (nicknamed the "Scorpion"). Developed as a light airborne tank for units like the 82nd and 101st Airborne divisions, the M56 Scorpion pictured belonged to the 173rd Armored Brigade and has just fired its 90mm gun which is in almost full recoil. The place is Long Khanh Province in South Vietnam in July 1966.



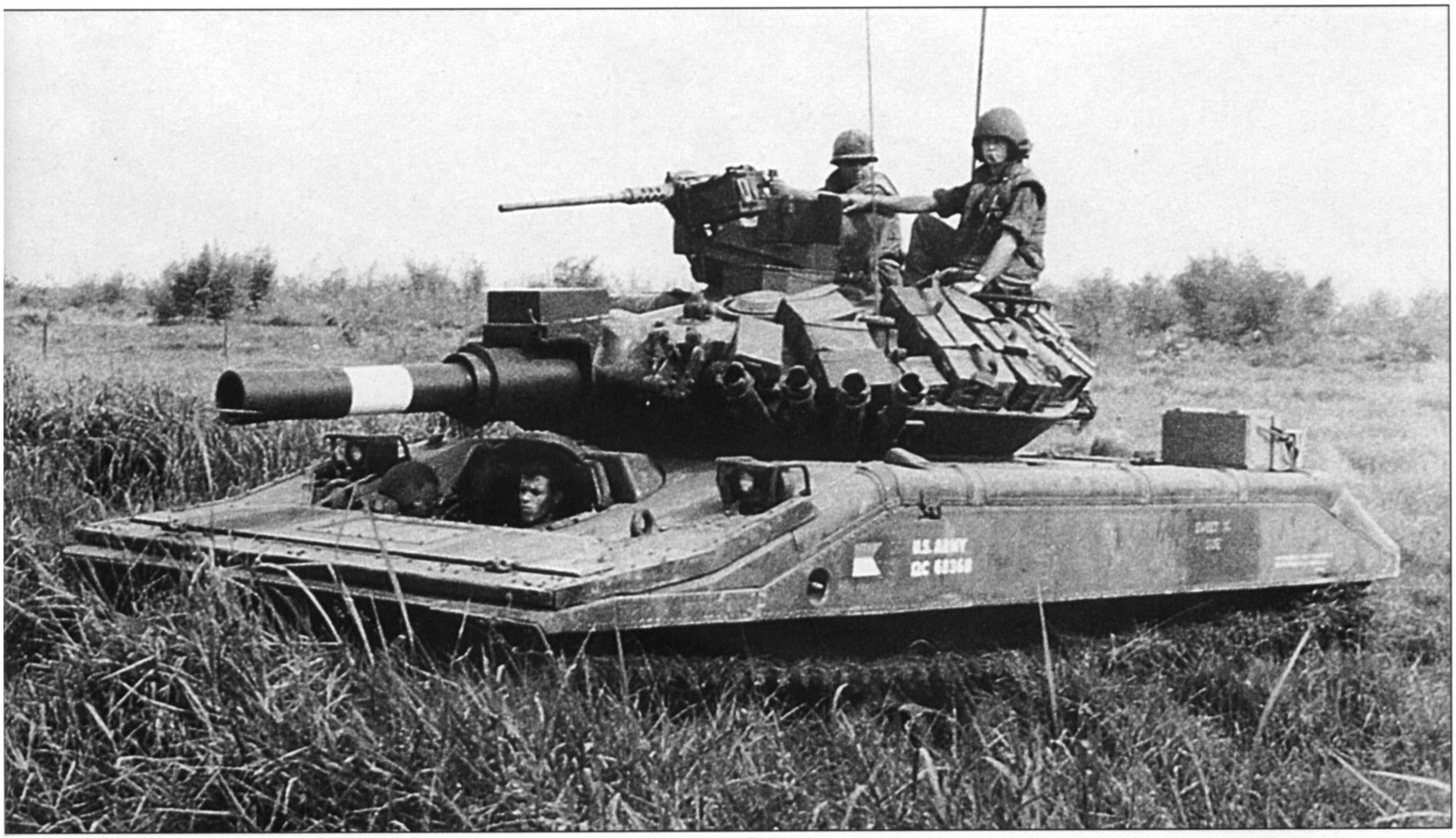
Because of the massive recoil that came from the 90mm gun when being fired, the M56 gunner could not see to adjust his fire, and had to have a dismounted observer to sense adjustments. Weighing about eight tons, this vehicle had no armor protection for its three-man crew other than a blast shield mounted on the gun. Pictured is an M56 from D Company, 173rd Airborne Brigade preparing to fire its main gun at enemy positions.



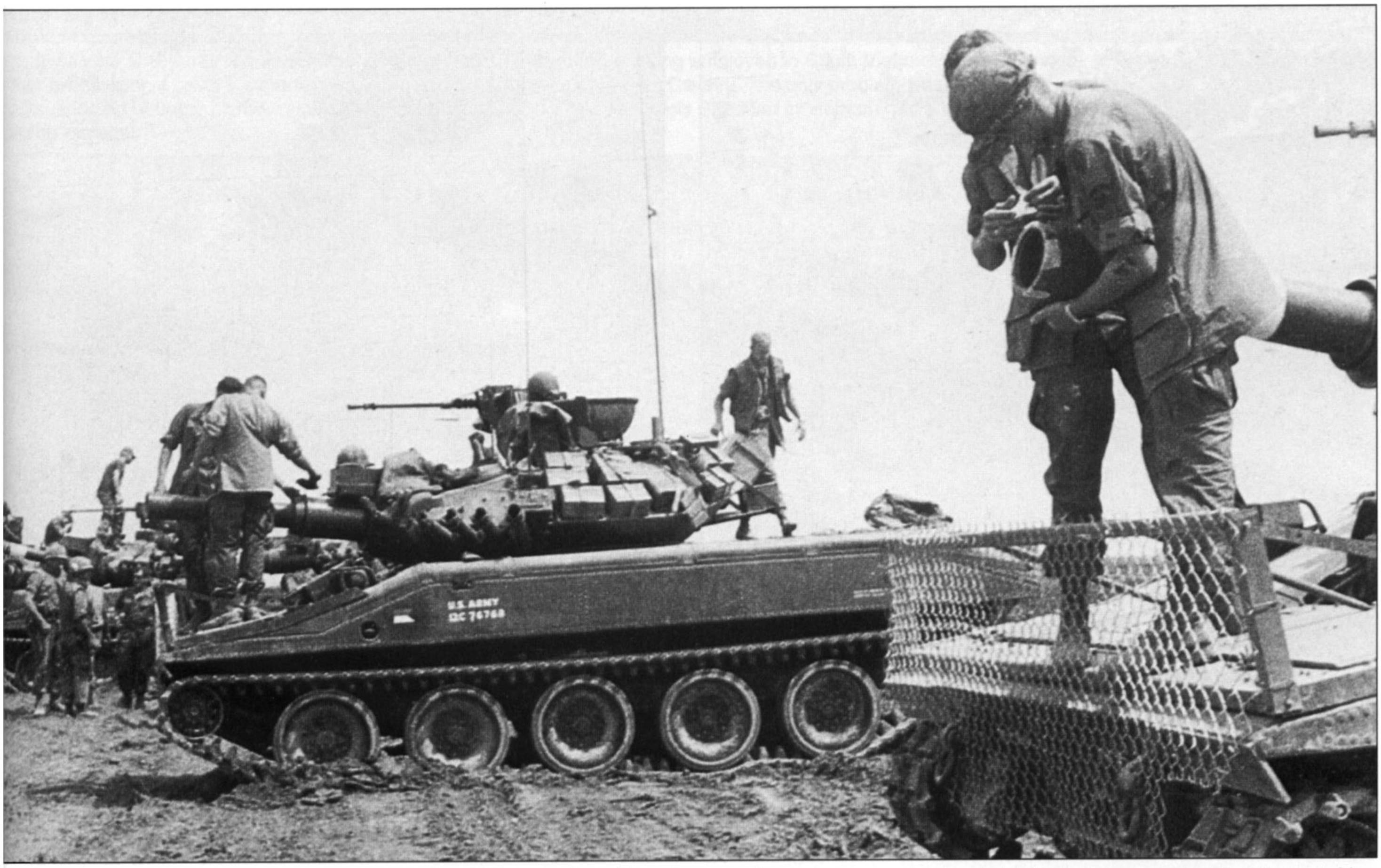
In early 1969 the U.S. Army introduced a new light tank into its inventory armored vehicles being used in Vietnam. It was the M551 armored reconnaissance/airborne assault vehicle which was nicknamed the Sheridan. The Sheridan was developed in 1959 as a replacement for the M41 light tank and M56 Scorpion self-propelled, airborne, antitank gun. Pictured is a vehicle from Troop D of the 3rd and 4th Cavalry serving in support of the 25th Infantry Division in February 1969, South Vietnam.



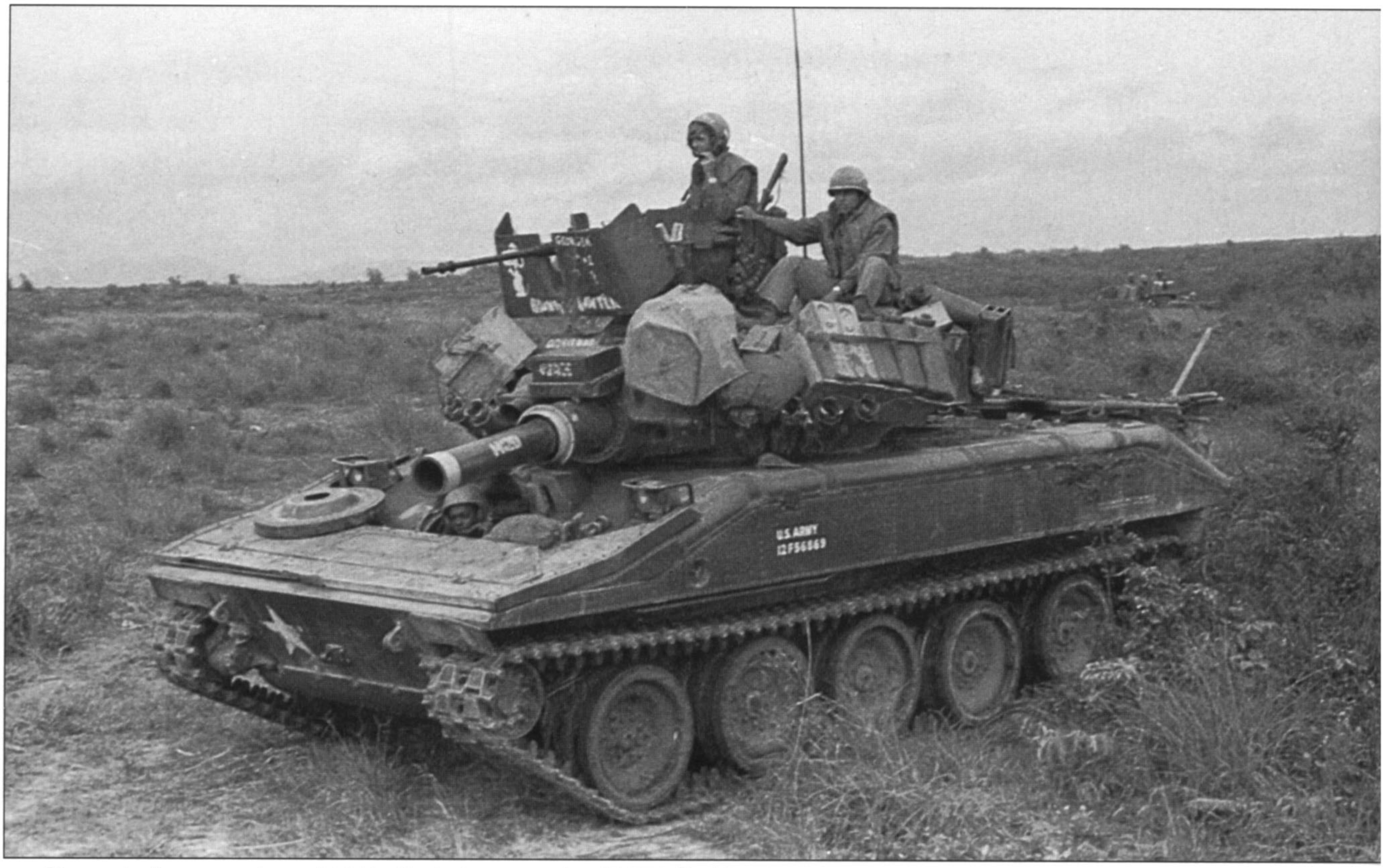
The U.S Army decided that the M551 Sheridan was to be sent to South Vietnam to replace the M48A3 Patton tanks in cavalry platoons of divisional cavalry squadrons and ACAVs that had been substituted for tanks in cavalry platoons of regimental cavalry squadrons. The regimental squadrons of the 11th Armored Cavalry Regiment kept their Patton tanks in the squadron tank companies. By late 1970 there would be almost 200 Sheridans deployed in Vietnam.



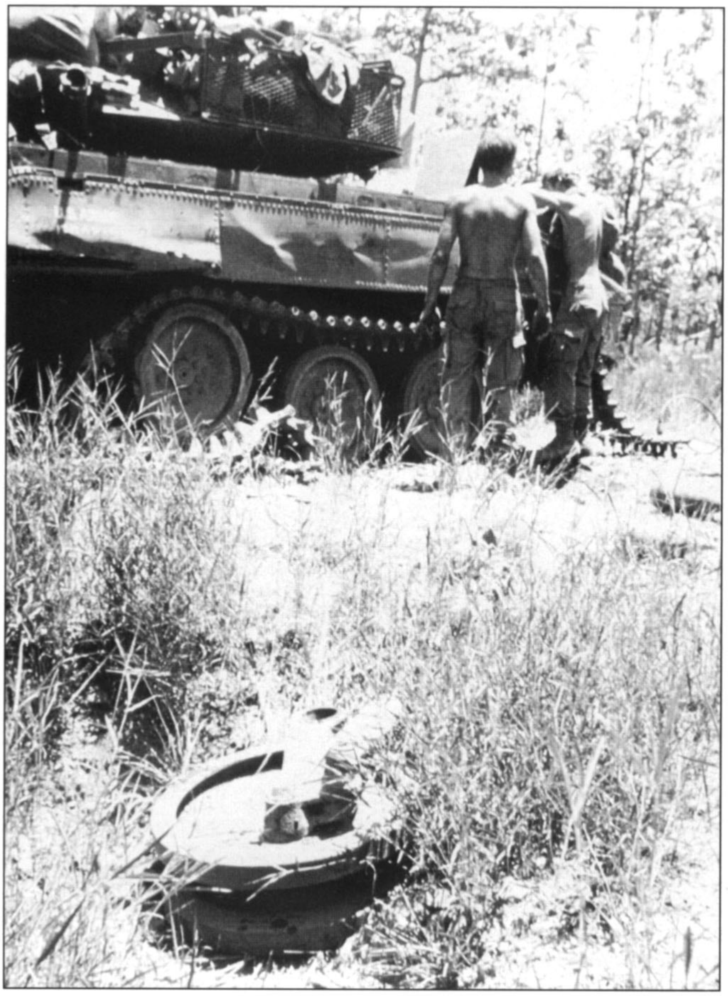
Armed with a 152mm main gun, firing a selection of combustible-case antitank rounds, the Sheridans sent to Vietnam were provided with a specially designed bee hive round just for use in that country since the threat from other tanks was just about nil. The Sheridan had a steel turret and aluminum armored hull. With a crew of four, the Sheridan was also armed with a .50 caliber machine gun for the vehicle commander, and a coaxial 7.62mm machine gun.



When the M551 Sheridans first appeared in South Vietnam they did not have any type of armor protection for the tank commander's .50 caliber machine gun as seen in this picture. To make up for this shortcoming many crews of Sheridans in South Vietnam used armored gun shields from M113s to offer some protection to the tank commander. Eventually, a production armor kit was developed to provide all-around protection for the tank commander when observing or using his machine gun.

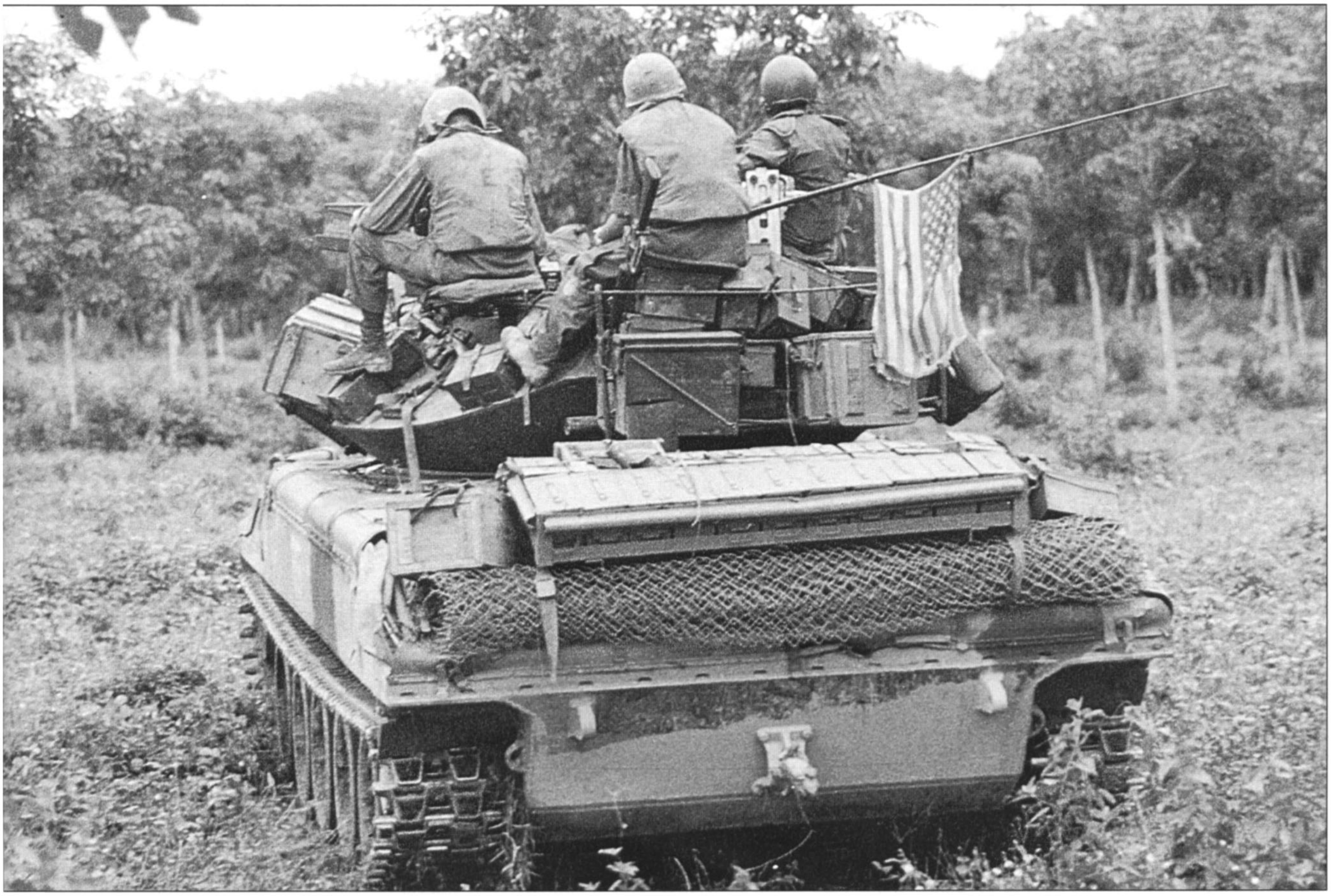


The production armored gun shield for the tank commander of M551 Sheridans is seen in this picture. Despite having frontal armor protection on the new production gun shields, many Sheridan crews would retain their M113 gunshields on the front of the new gun shield.

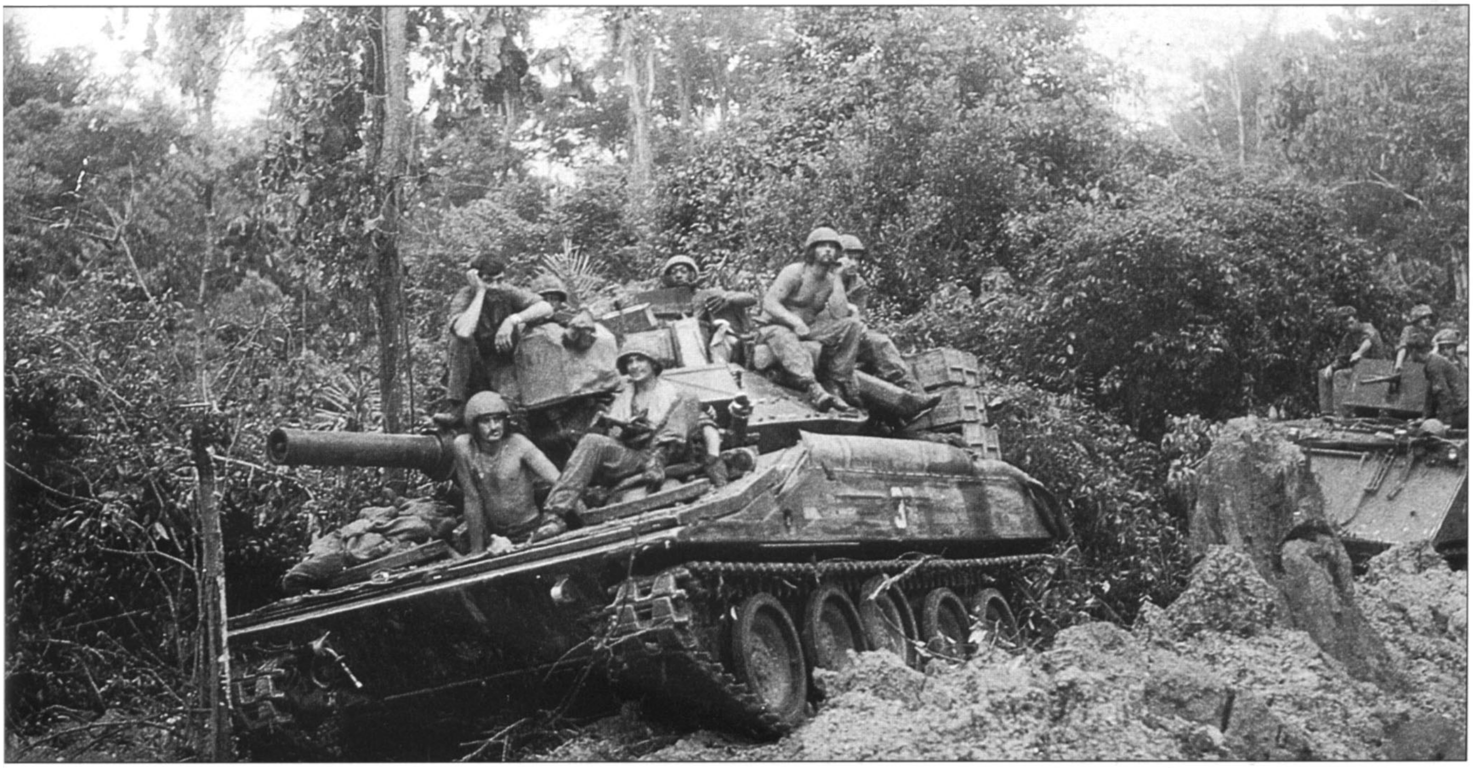


While the design of the Sheridan was revolutionary in many ways, the vehicle suffered from a large number of design defects, ranging from the transmission to the combustible-cased 152mm conventional ammunition used. Despite tests conducted at the U.S. Army Jungle War School in Panama (prior to the vehicle being shipped to Vietnam) that showed the M551 was ill-suited to combat in a hot, humid jungle environment, the Army sent the M551 to Vietnam anyway. Pictured in Vietnam an M551 is confronted by a blown bridge.

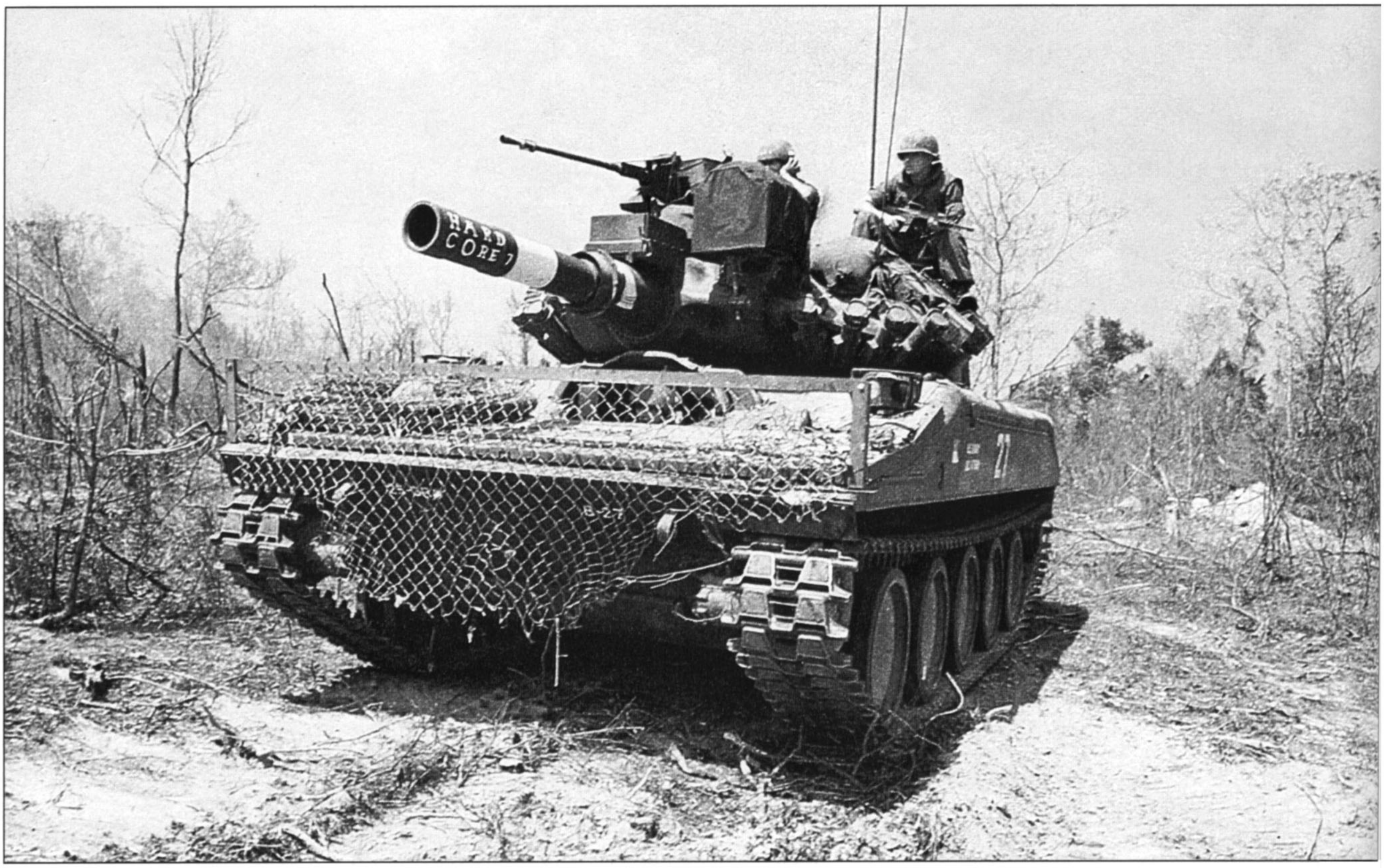
Unlike the heavy steel belly armor of the M48A3 tank that would normally protect the crew from any mine blast, the thin underside of the M551 was very vulnerable to any size mine. Many crews (besides the driver) would refuse to ride inside the vehicle unless the bullets started to fly. This Sheridan tank from the 11th Armored Cavalry Regiment had its track blown off by a mine on Highway 7 on May 8, 1970.



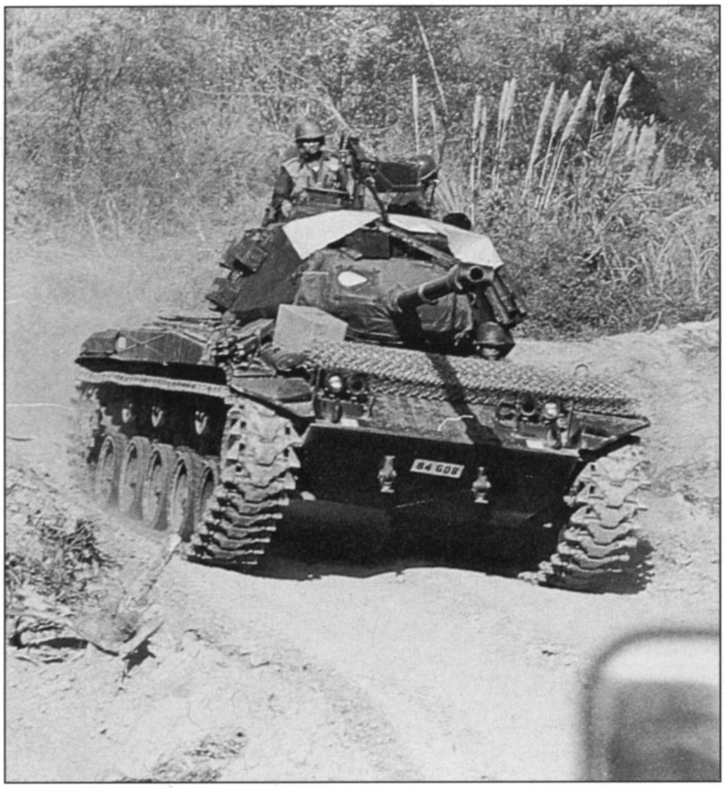
It was the U.S. Army top brass which had insisted on the Sheridan being employed in South Vietnam by cavalry units. In 1968 plans were approved to equip two divisional cavalry squadrons, the 1st and 3d Squadron of the 4th Cavalry. The only problem was that neither unit wanted the Sheridan because it was suspected of being highly vulnerable to mines and RPGs. The rear of this Sheridan in Vietnam has a lot of onboard stowage including some chain link fencing material.



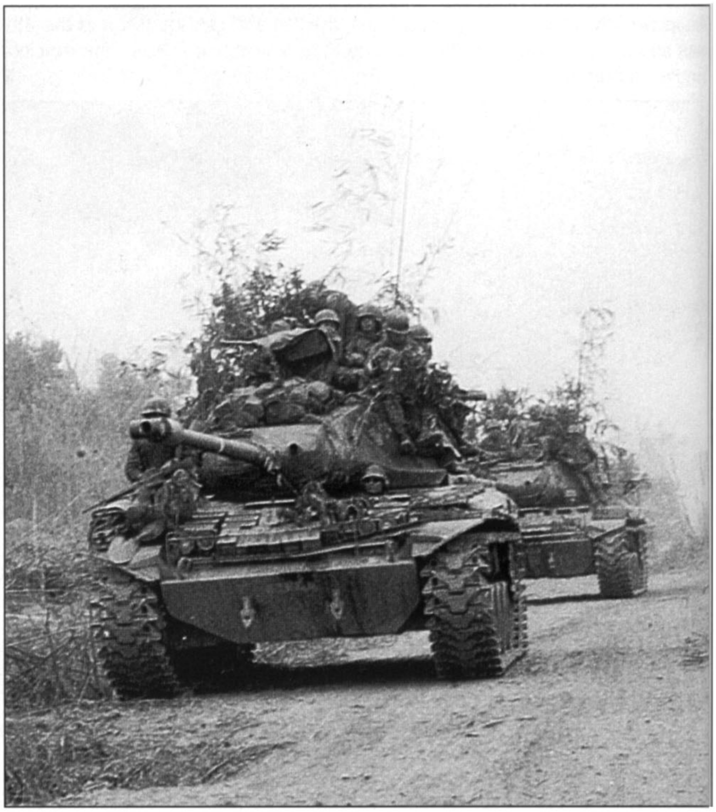
In a last minute change of plans the new M551 Sheridans were sent to the 1st Squadron, 11th Armored Cavalry Regiment and only the 3rd Squadron, 4th Cavalry received the vehicle. By 1970 almost every cavalry unit in Vietnam was equipped with the Sheridan. Despite some successes with the vehicle in combat, the Sheridan was still very prone to a catastrophe explosion when running over a mine. This fact caused the crews of Sheridans to abandon their vehicles very quickly. In contrast the M48A3 could take numerous hits and still continue to fight on.



Another disadvantage of the M551 Sheridan discovered in Vietnam was the fact that the vehicle's all electrical fire-control system broke down repeatedly during the country's rainy season. Pictured is an M551 which is fitted with a small chain link frame at the front hull of the vehicle. While this fencing material could help protect the vehicle from RPG rounds, more likely it was installed as a brush guard for the driver.

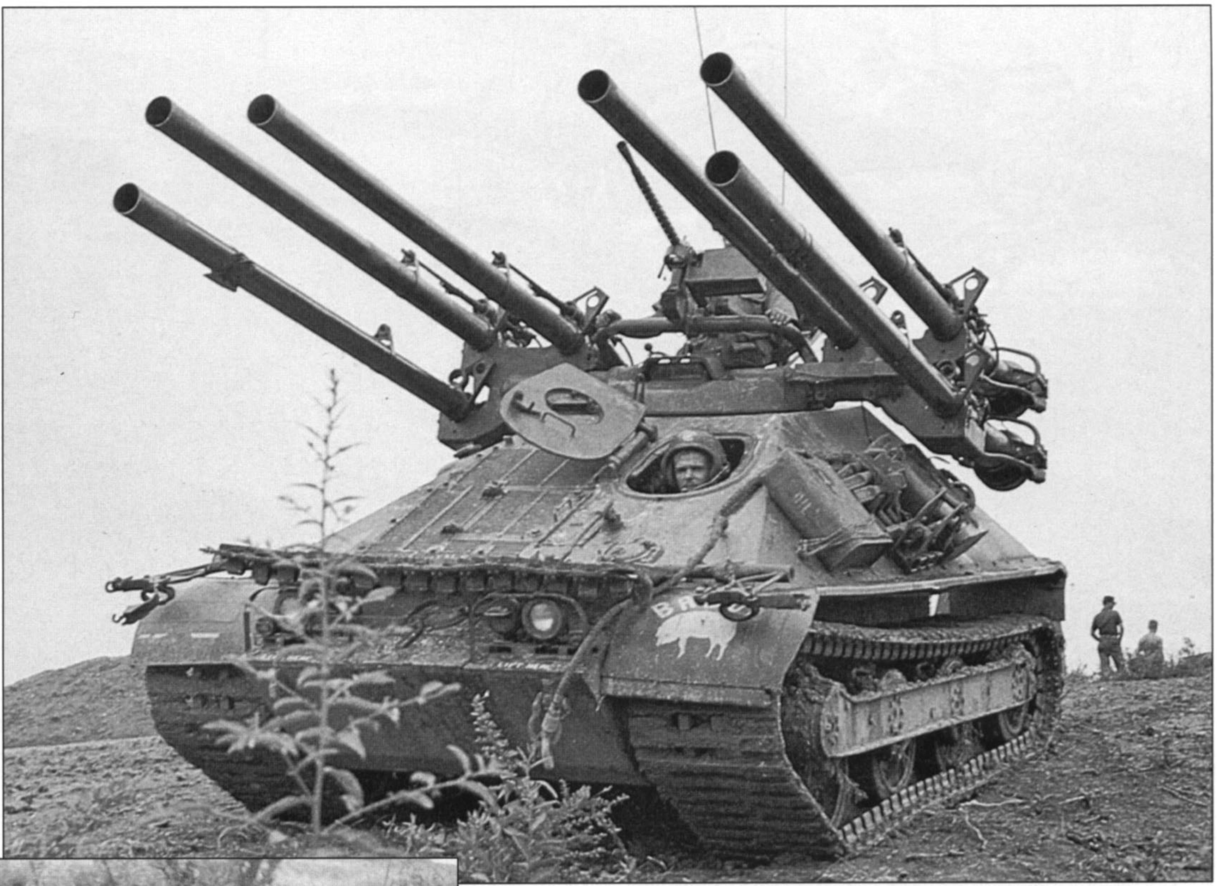


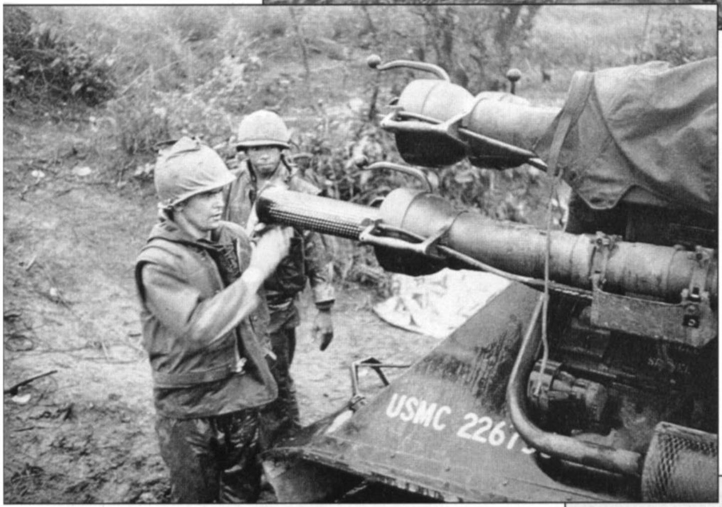
To replace the ARVN's aging fleet of obsolete WWII era M24 light tanks, the U.S. Army supplied the ARVN in 1965 with a fleet of M41A3 light tanks. The M41 series of light tanks were nicknamed the "Walker Bulldog" after U.S. Army Lieutenant General Walton Walker, who was killed in Korea in 1951. Armed with a 76mm gun and two machine guns, the vehicle had a crew of four. The M41A3 tank pictured is taking part in an attack into Laos in late 1971 by the ARVN.



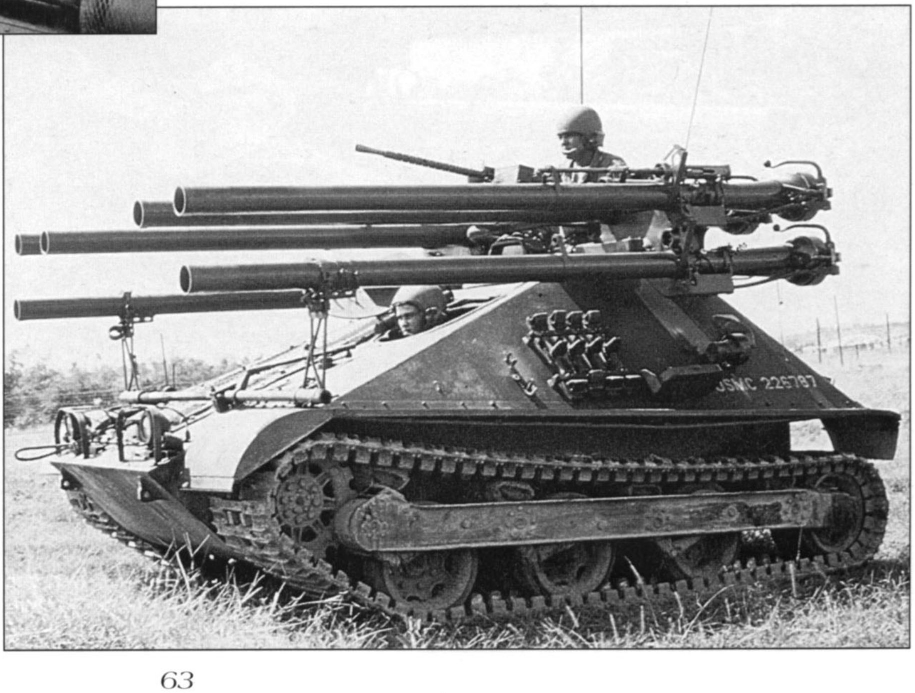
Pictured are two ARVN M41A3 tanks taking part in the 1971 raid into Laos. Notice the extra ammunition boxes piled up on the tank's front hull. The M41A3 tank was powered by a 6 cylinder, supercharged, air-cooled, fuel injection, Continental AOS-895-3 gasoline engine. This engine could propel the vehicle up to 44mph. Maximum range was roughly 100 miles. The M41's engine was coupled to a GMC CD 500-3 cross drive transmission.

Used by the U.S. Marine Corps in Vietnam was the M50 (nicknamed the "Ontos"). Similar in concept to the U.S. Army M56 Scorpion, it was designed as a cheap, small, lightweight antitank weapon system. A total of 297 vehicles were built by the Allis-Chalmers Company between 1955 and 1957. Instead of a single antitank gun the M50 Ontos mounted six 106mm recoilless rifles, three on either side of the vehicle.

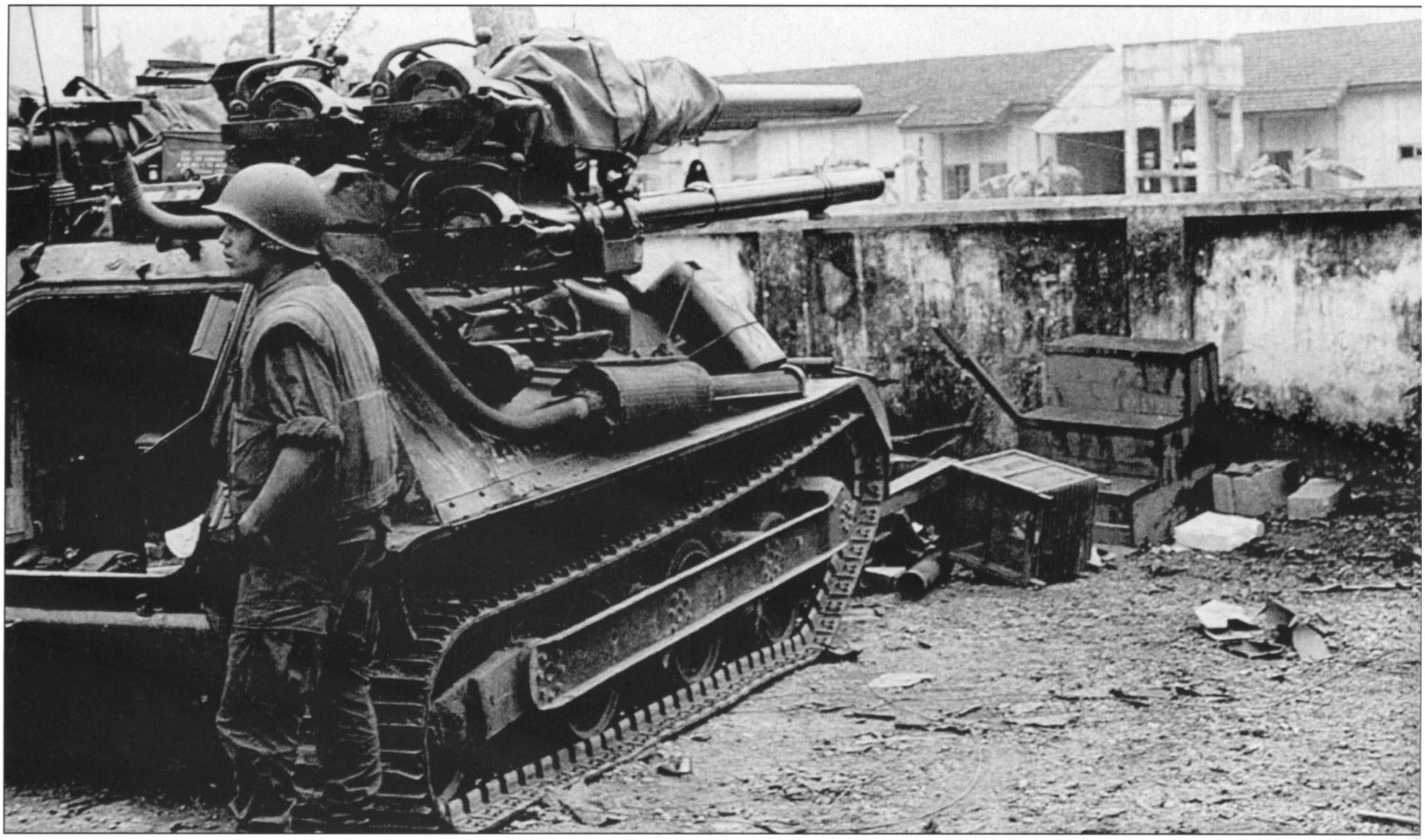




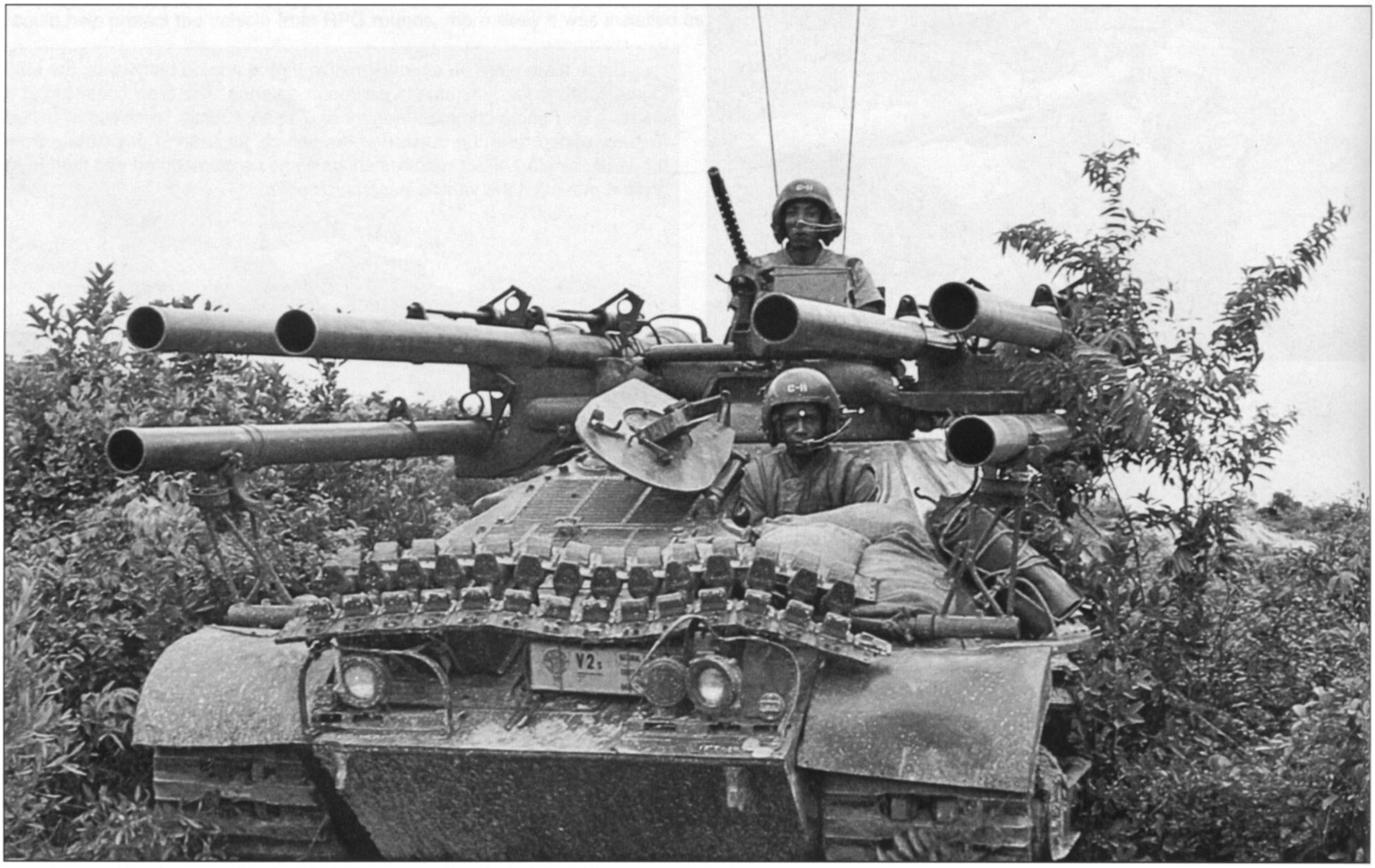
Since there were no enemy tanks in Vietnam to do battle with, the M50 Ontos spent most of its time in perimeter defense. The crew consisted of a driver, loader and a commander/gunner. The six 106mm recoilless rifles had to be reloaded from the outside of the vehicle as seen in this picture from the Vietnam War. All six recoilless rifles could be dismounted and fired from ground mounts if the vehicle became disabled.



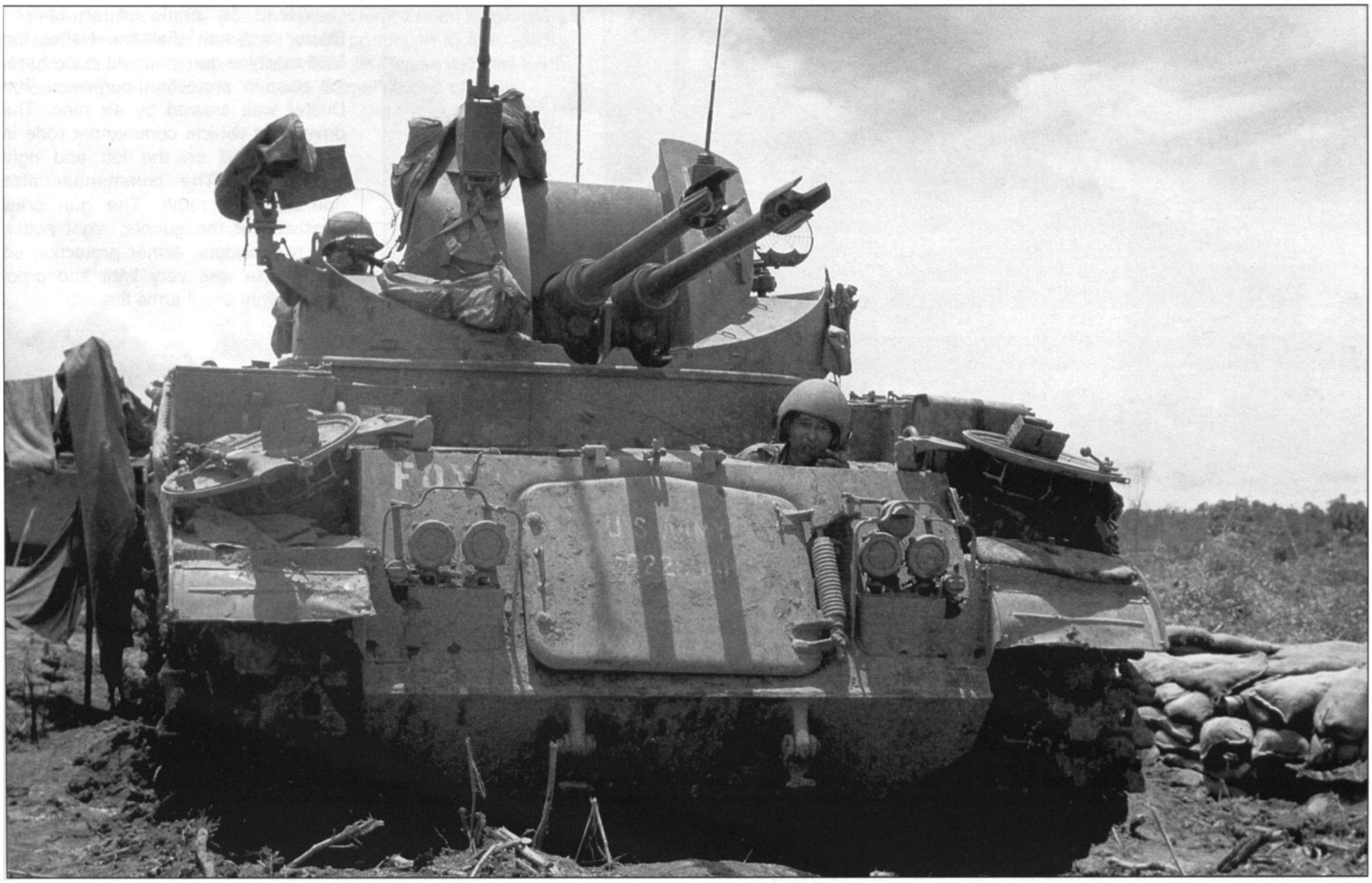
The M50 Ontos was built out of 1/2 inch steel armor except for the hull floor which was a 1/4 inch thick. The six recoilless rifles on the vehicle were generally aimed by turning the vehicle in the direction of the target. To obtain the range to a target the Ontos crew had four .50 caliber spotting rifles installed over the vehicle's recoilless rifles. All of the spotting rifles were magazine fed, semiautomatic, weapons firing a special .50 caliber tracer round which produced a puff of smoke on impact.



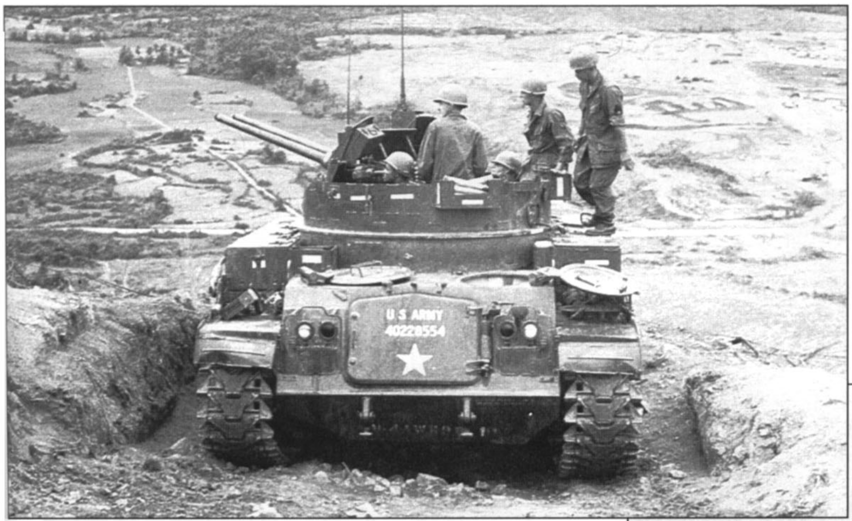
The M50 Ontos was also fitted with a .30 caliber machine gun which was mounted between the 106mm recoilless rifles. The machine gun could be fired either from inside the vehicle or operated manually by the gunner standing in the open hatch. The vehicle's recoilless rifles could be rotated 40 degrees to the left or right of center and elevated through a range of minus 10 degrees to plus 20 degrees.



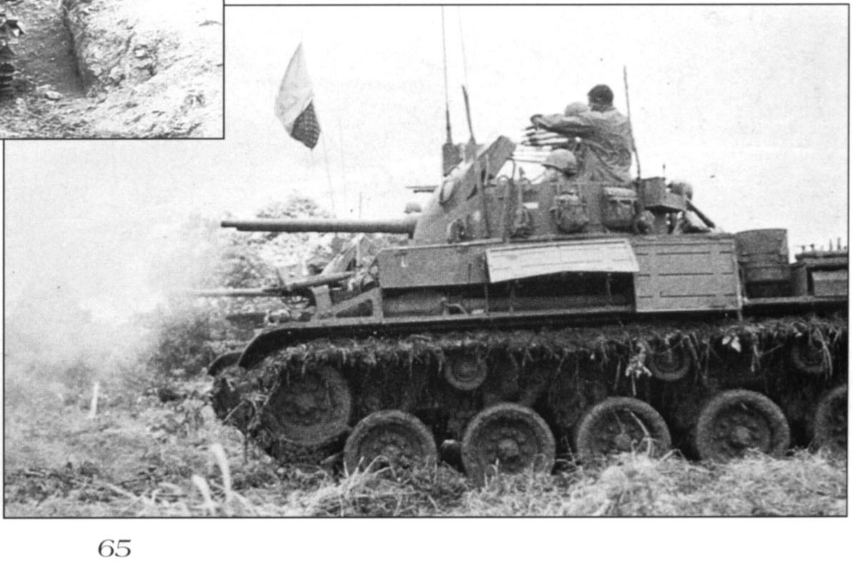
Ammunition stowage for the M50 Ontos consisted of eight 106mm rounds in the lower hull stowage compartment, four rounds were carried in the right rear of the crew compartment bringing the total ammunition supply to 18 if all the rifles were loaded. The Ontos could fire three types of rounds; a high explosive plastic with tracer (HEP-T) M346, the high explosive antitank (HEAT) M344, and a bee hive round for anti-personnel use.



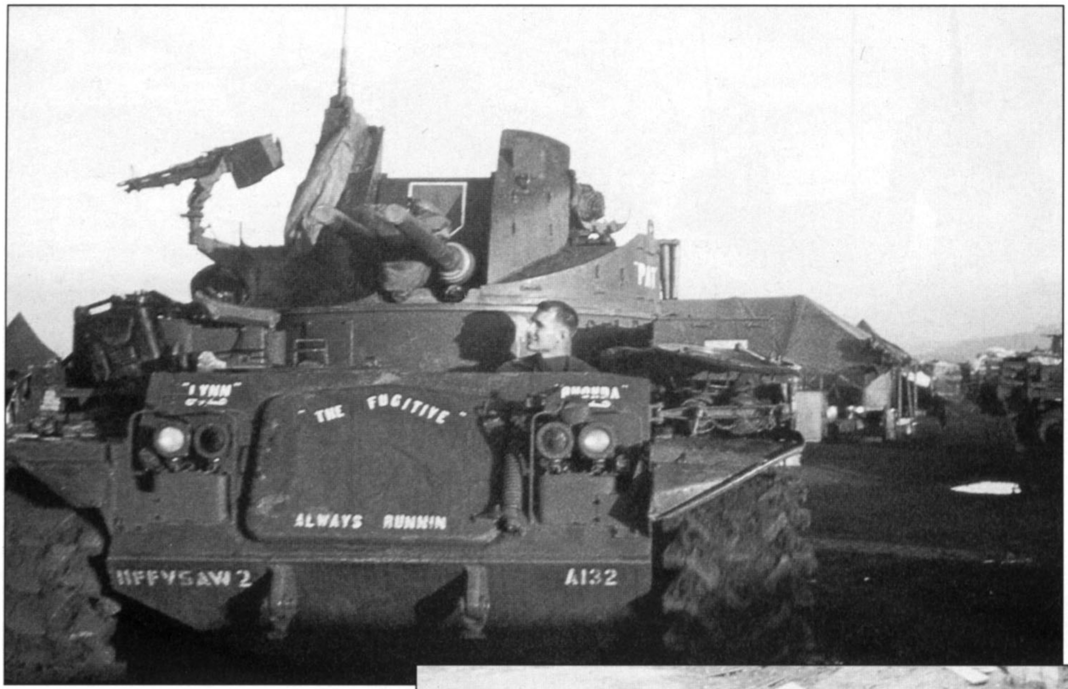
Like the U.S. Army's M56 Scorpion and the Marine Corps M56 Ontos, the M42A1 anti-aircraft tank (nicknamed the "Duster") was not designed with the war in Vietnam in mind but saw heavy service anyway. Designed to shoot down planes, the M42A1 Duster instead found a very useful role as a perimeter defense or convoy support vehicle in Vietnam. Based on the chassis of the M41 light tank, the M42A1 boasted two dual-mounted 40mm Bofors automatic guns. This M42A1 Duster has its twin Bofors guns trained on their area of perimeter defense in Dak To Province during "Operation Greely" on July 15, 1967.



There were three Army battalions in Vietnam that were equipped with the M42Al Duster. Attached to each Duster unit was a battery of M55 (6x6 Army trucks) mounting quad-.50 caliber mounts. The driving compartment of the Duster was in front with a door in the hull front and two roof hatches. The gun mount was in the center with 360 degree traverse using both power and manual operation.

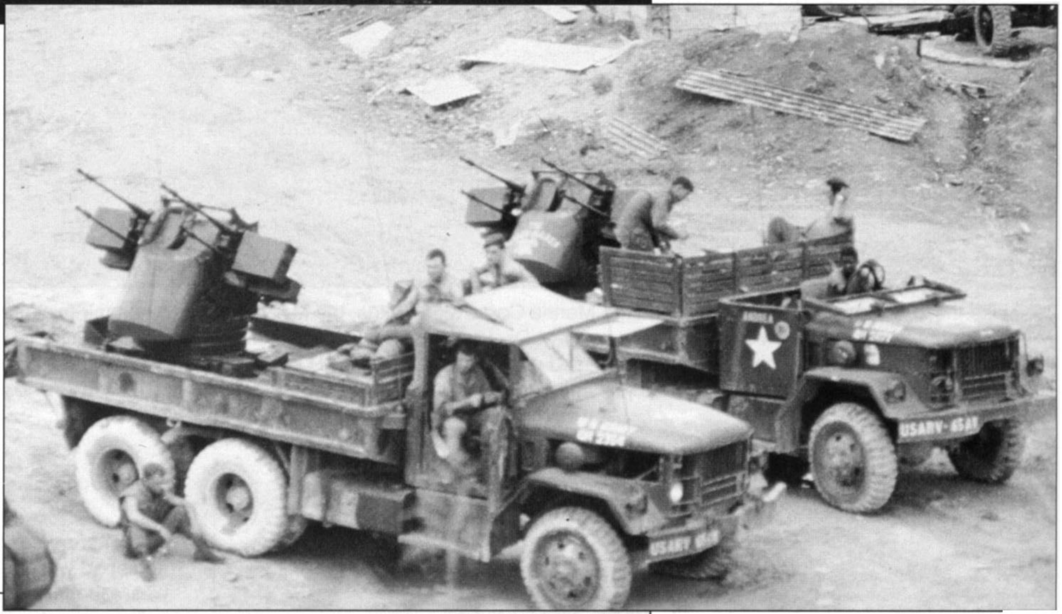


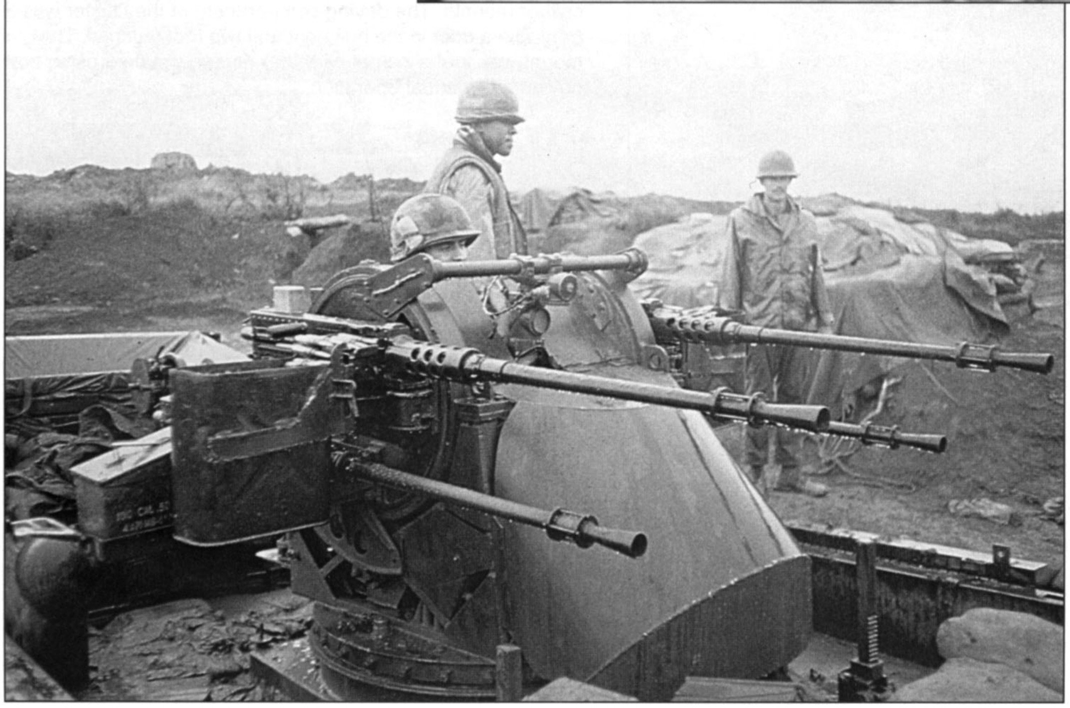
The two 40mm guns mounted on the M42 Duster had a power elevation ranging from minus 3 degrees to plus 85 degrees. The manual elevation cranks could lower the guns to minus 5 degrees to plus 87 degrees. The Duster carried roughly 480 rounds of 40mm ammunition. The vehicle's engine compartment was in the rear. The Duster was powered by a 6 cylinder, opposed, supercharged, fuel injection gasoline engine that gave it a top speed of 45mph. A Duster is pictured firing at enemy targets.



Head on photo of an M42A1 Duster in South Vietnam. Notice the M60 machine gun mounted in the turret for close-in protection purposes. The Duster was crewed by six men. The driver and vehicle commander rode in the front hull on the left and right respectively. The commander also operated the radio. The gun crew consisted of the gunner, sight setter, and two loaders. Armor protection on the vehicle was very light and proof against light small arms fire.

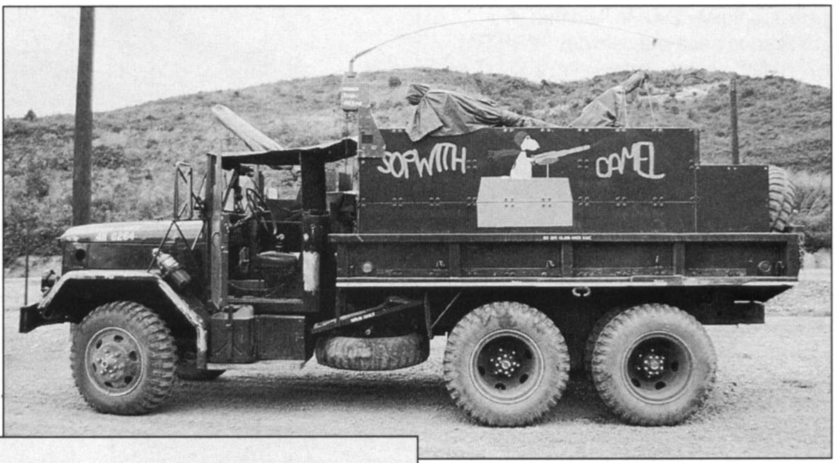
Each of the Duster units in South Vietnam was supported by a battery of truck-mounted M55 quad .50 caliber machines gun as pictured. Like the M42 Duster these vehicles were used for both convoy escort as well as perimeter defense of artillery bases. The only armor protection on the first models of these vehicle was for the gunner. Later models of these vehicles were fitted with titanium plates for both the cab and the cargo area where the machine guns were mounted.

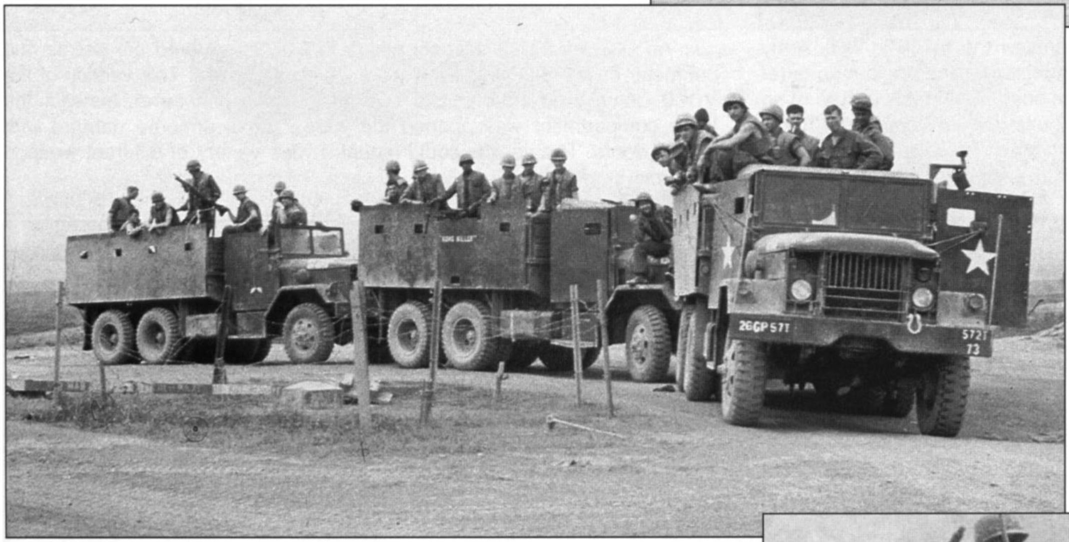




Close-up view of the truck-mounted quad .50 caliber machine guns.

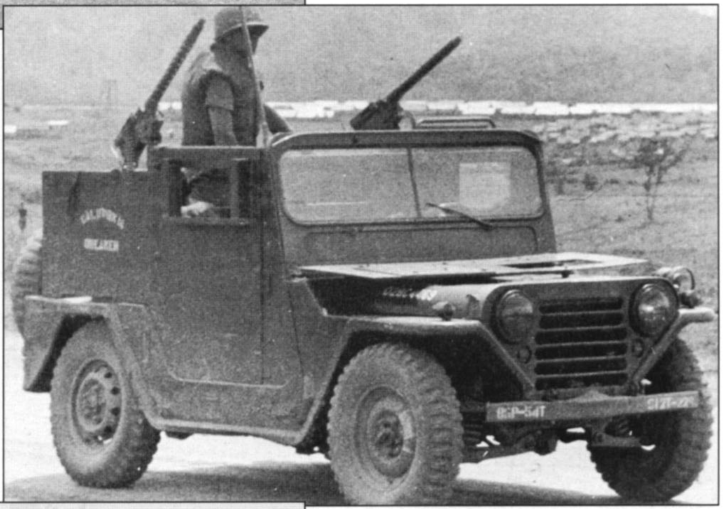
Many truck supply units in Vietnam took it upon themselves to add some type of makeshift armor protection to their trucks for protection in case of enemy ambushes. These vehicles were known as gun-trucks and "Sopwith Camel" is one of them.

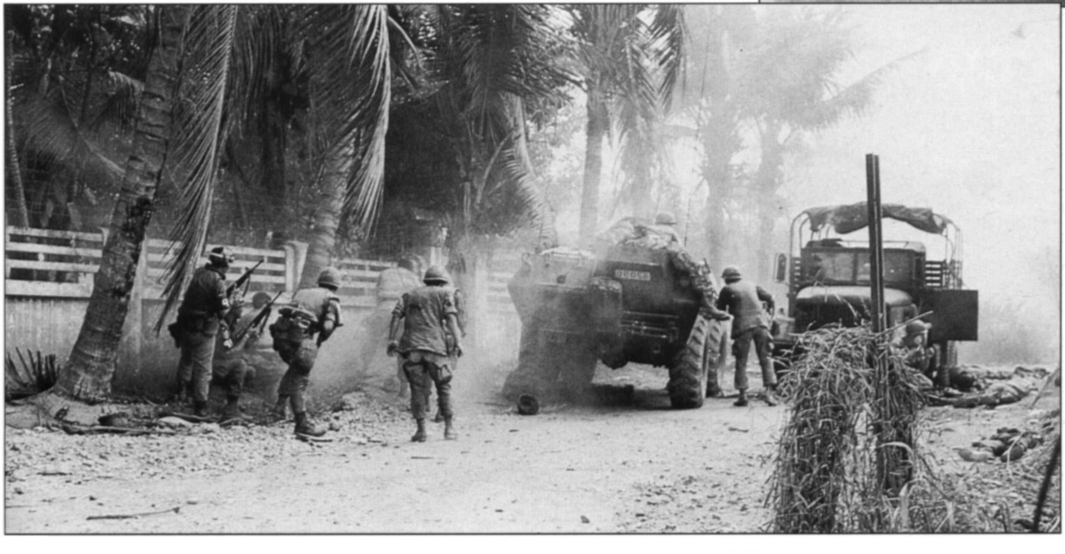




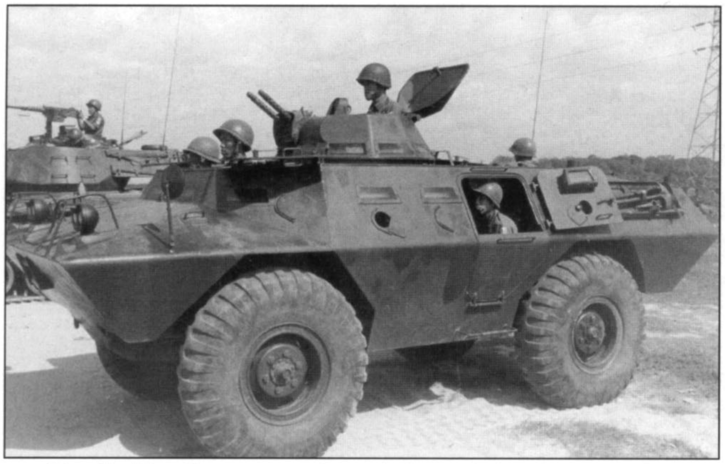
As M113s were not always available on convoy escort duties, truck units employed gun-trucks to provide the necessary security. These trucks are lightly armed with M60 machine guns.

Besides trucks being armored for convoy escort duties, the M151 jeep was sometimes given a make-shift armor array. Unfortunately, this tended to severely overload the chassis with the extra weight.

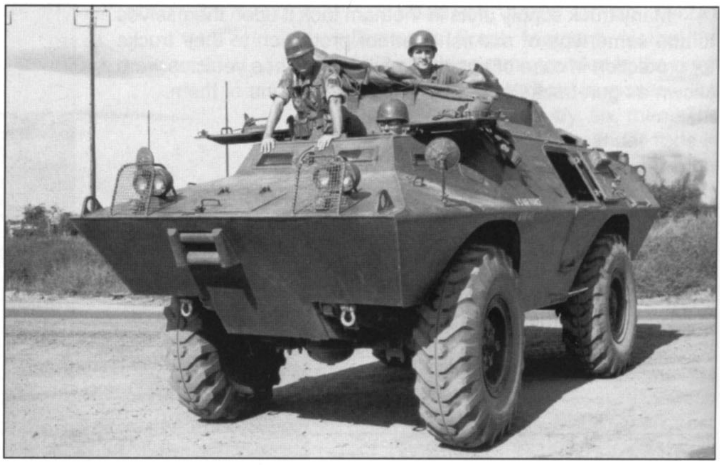




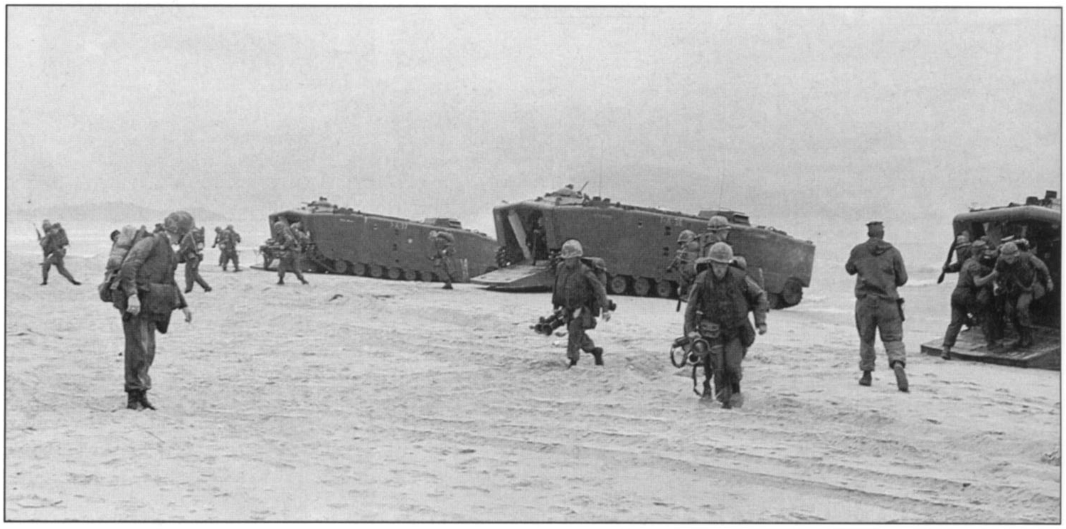
As time went on, the homemade armored trucks and jeeps proved to be unsuitable for the job of convoy escort. As a result, the American military bought for use in Vietnam a large number of the American-built Cadillac-Gage Commando V-100 series armored cars. Different versions of these armored cars were supplied to U.S Army military police units as well as ARVN and U.S. Air Force security units. The ARVN Commando armored car pictured is taking part in the battle for Saigon in late January 1968.



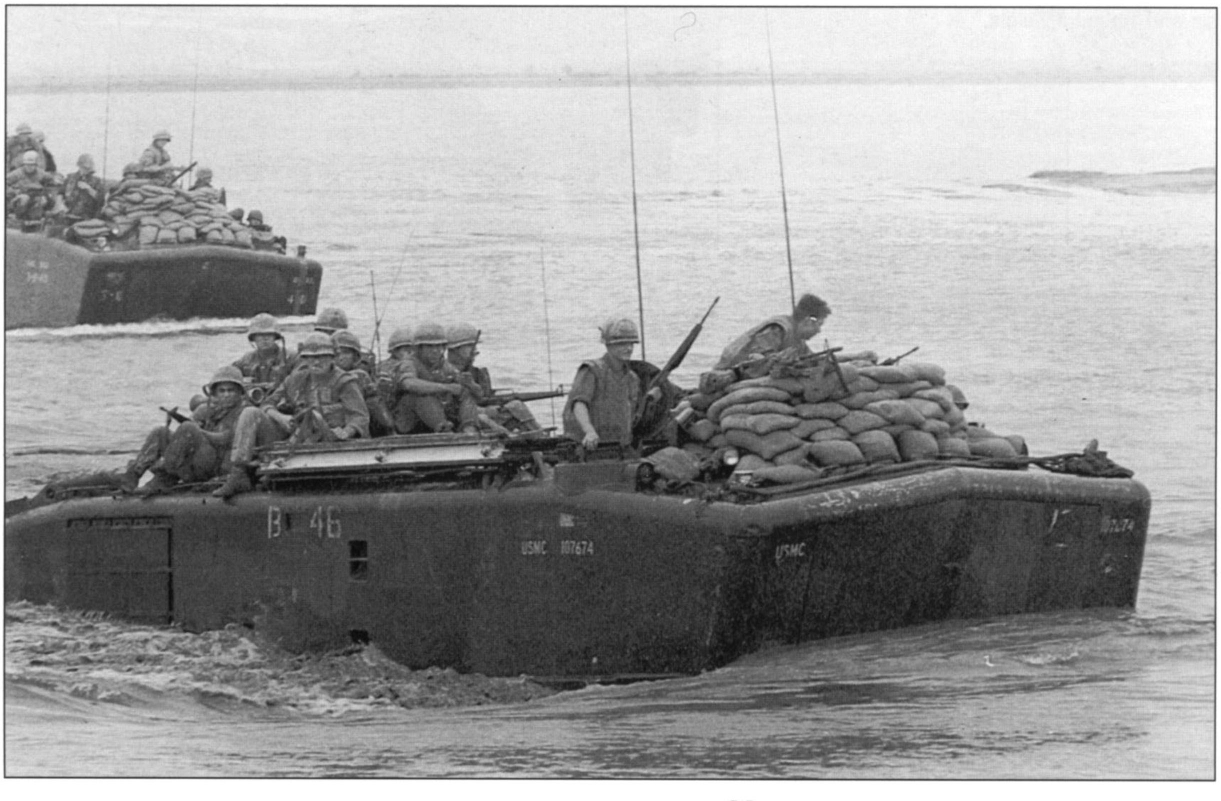
The Cadillac Gage armored car designated the M706 in U.S. Army service (also nicknamed the "Duck") could be fitted with a single-man turret armed with twin .30 caliber machine guns as seen here in this picture of an ARVN armored car, or twin 7.62 machine guns. Earlier versions of these armored cars designated as the XM706 had a turret that mounted both a .50 caliber machine gun as well as an .30 caliber machine gun.



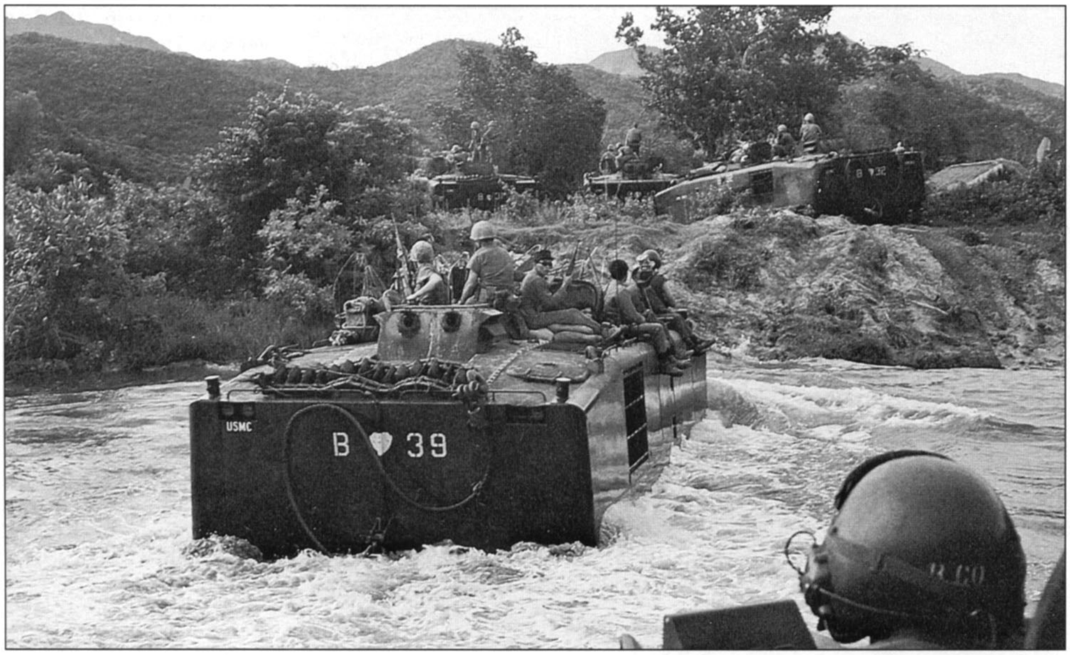
An U.S. Air Force security police XM706E2 armored car patrols the perimeter of Tan Son Nhut Air Base in November 1968. This version of the V-100 Commando armored car had no machine gun turret. Instead, the troop compartment was opened top with a small armored parapet with folding doors. The vehicle could mount a wide variety of different weapon systems.



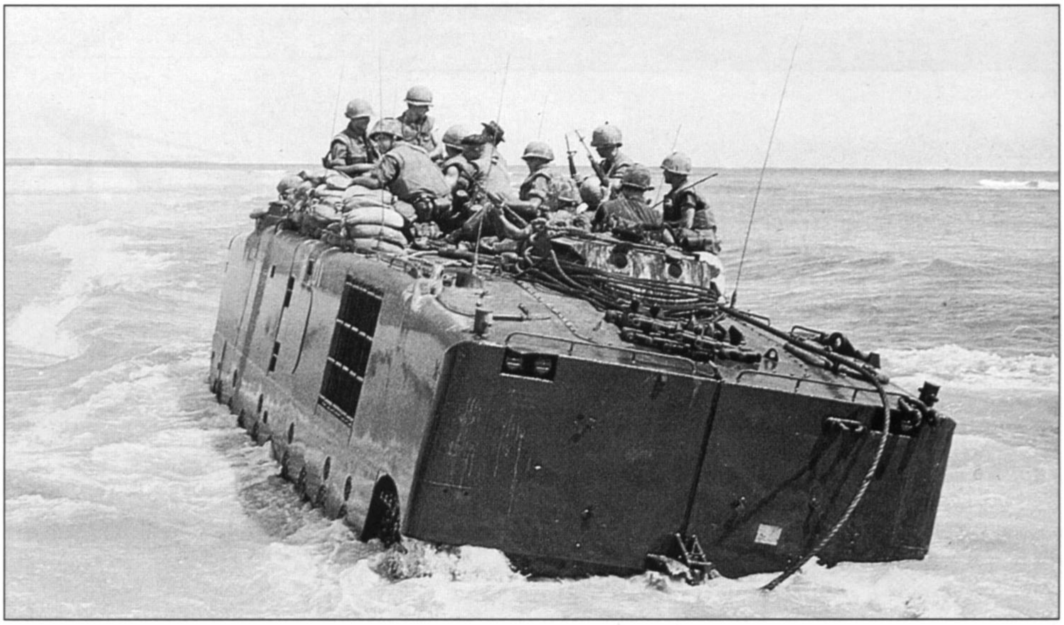
Since the U.S. Marine Corps did not have any vehicle similar to the M113, as used by the U.S. Army and ARVN forces, they were forced to rely on their LVTP5A1 armored amphibious assault vehicle. (LVTP5 stood for Landing Vehicle, Tracked, Personnel, Model 5). Over 1,000 of the large and slow vehicles were built for the corps. Pictured coming ashore in South Vietnam are Marines who have just left their LVTP5A1s.



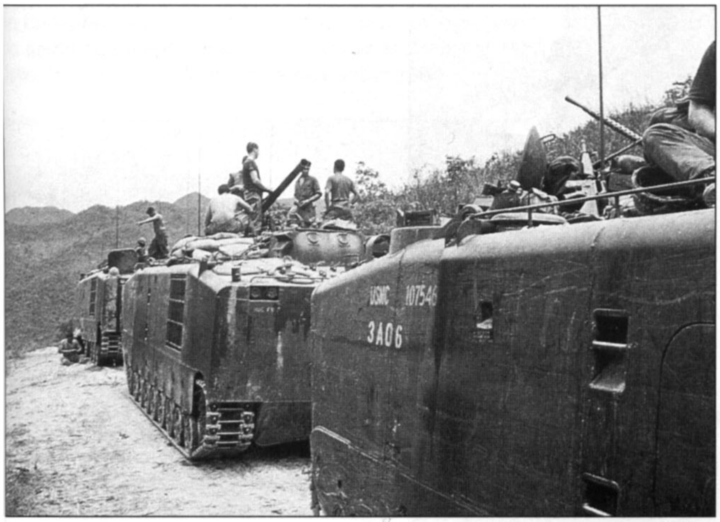
South Vietnam, March 1968, U.S. Marines are piled on top of their LVTP5A1 as it crosses the Qua Viet River. While the LVTP5A1 had a machine gun equipped turret it proved fairly useless in Vietnam. Crews of LVTP5A1 vehicles often build up sandbag bunkers on top of their vehicles to mount another machine gun.



A number of U.S. Marine Corps LVTP5A1 vehicles are seen conducting a sweep for enemy troops ten miles south of Da Nang Air Base in June 1965. The LVTP5A1 was able to carry 34 soldiers sitting down in an emergency or 45 soldiers standing up. Due to the heat of South Vietnam and fear of mines, most Marines tended to ride on top of vehicles be it on land or sea.



The various versions of the basic LVTP5A1 vehicle were built by a number of different manufacturers including; FMC, Baldwin-Lima-Hamilton Ingersoll, Pacific Car and Foundry, and the St. Louis Car Company. During the vehicle's service life a number of improvements were made. Unfortunately, the vehicle was poorly designed to begin with and was plagued by maintenance problems. This vehicle pictured in South Vietnam is a command post vehicle as is evident by all the antennas.



The hull of the LVTP5A1 series of vehicles was made up of armor plate no thicker than a 1/2 inch. The vehicle's driver and commander sat on either side of the front hull. The vehicle's gasoline engine was located at the rear of the vehicle. The fuel tanks for the engine were located at the bottom of the hull.

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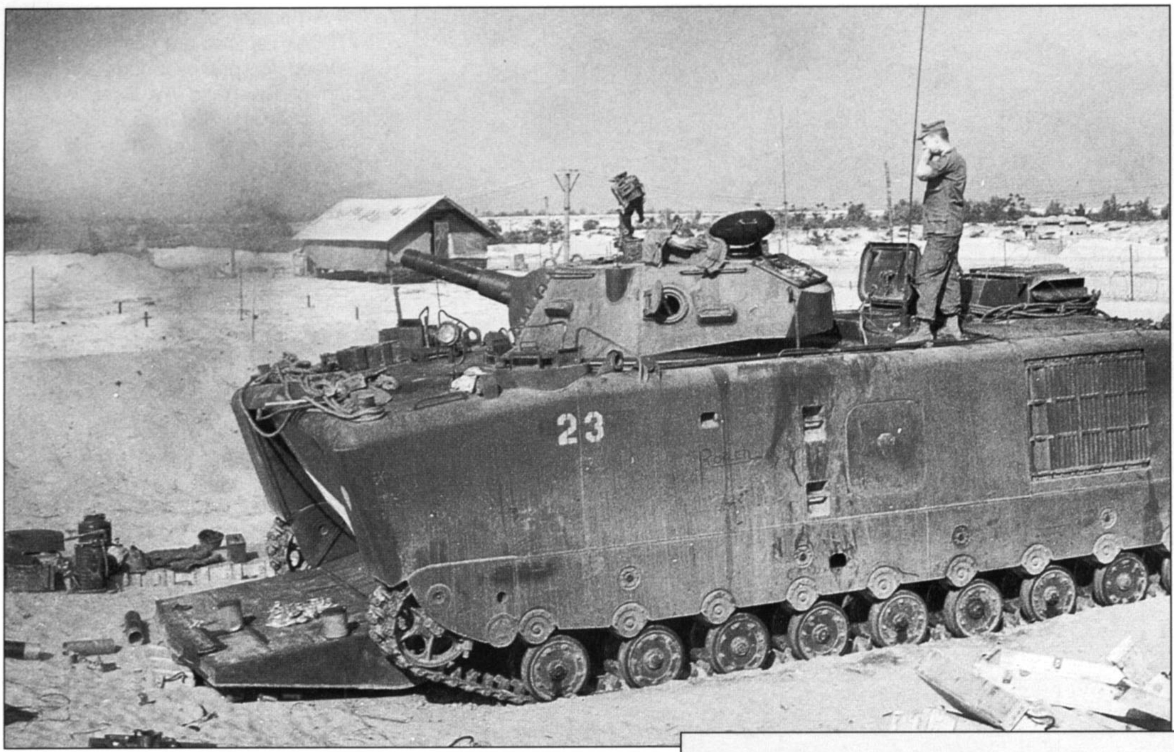
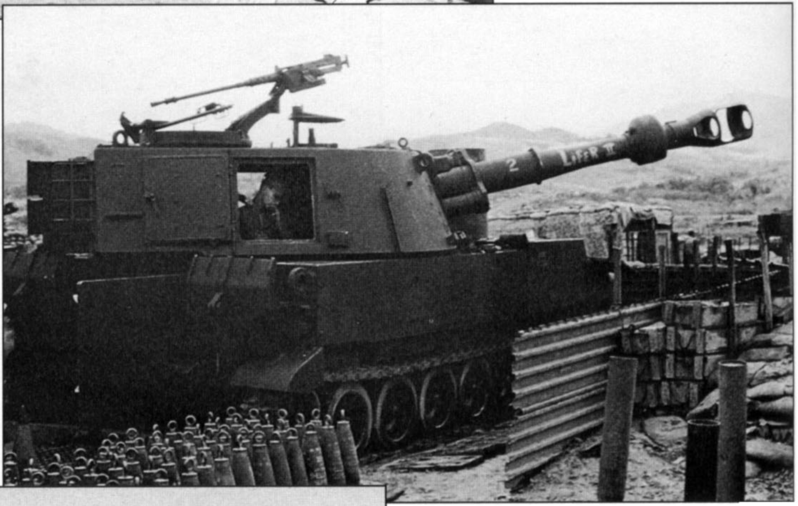
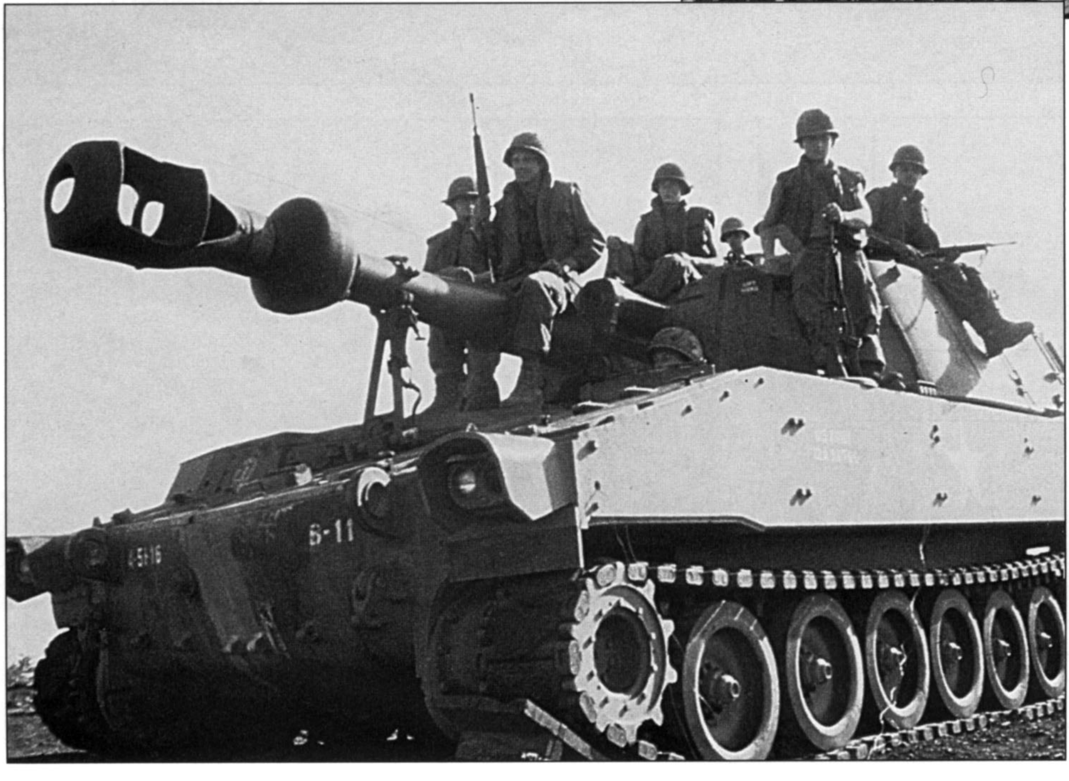
While the design feature with the fuel tank located at the bottom of the hull made little difference when the LVTP5A1 was in the water, however while on land, the Marines quickly found out that running over a mine was almost certain death for anybody inside the vehicle. Except for the drivers of LVTP5A1 vehicles everybody in Vietnam rode on top of the vehicles as can be seen in this picture.



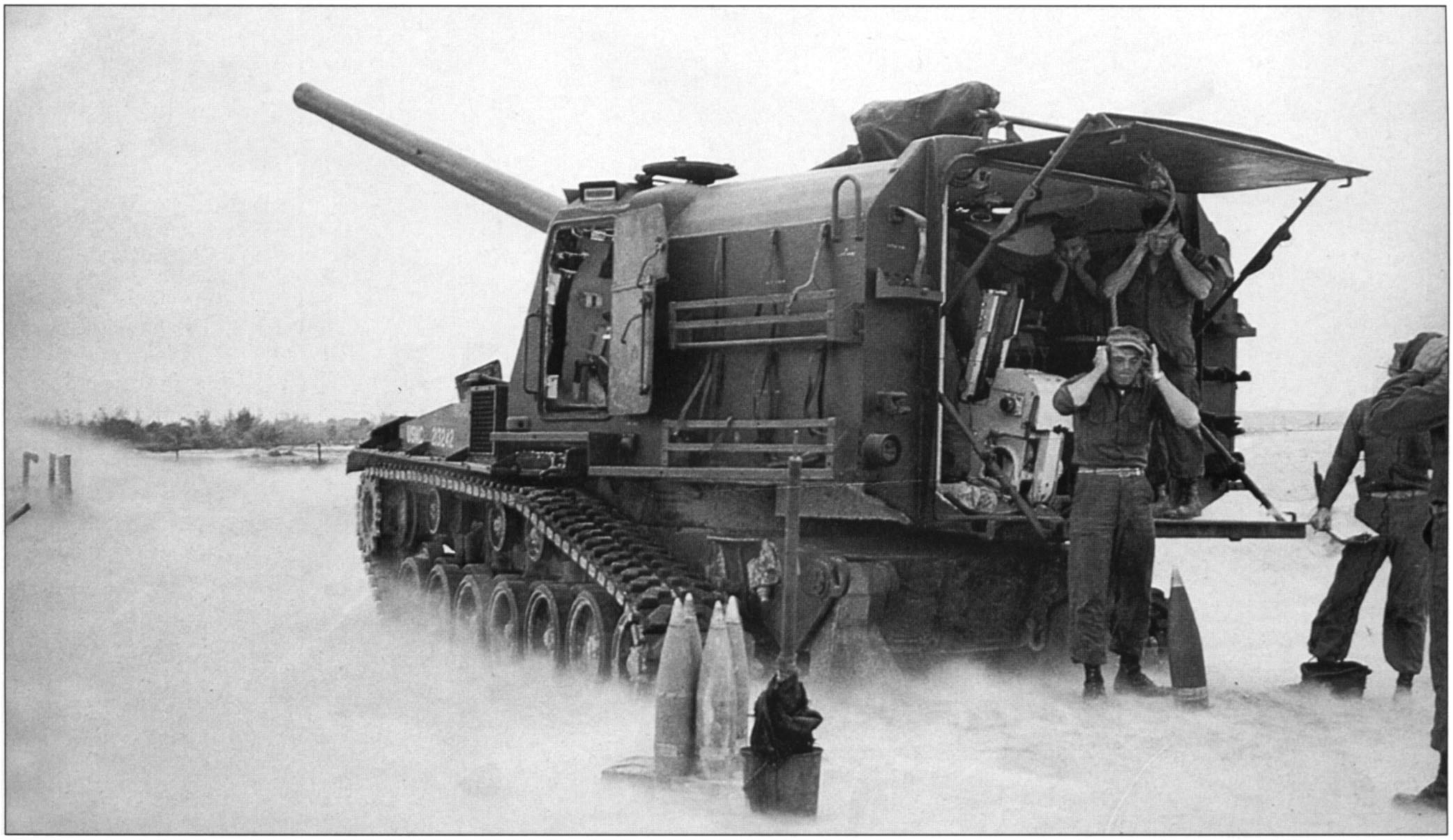
The LVTH6 (Landing Vehicle, Tracked, Howitzer, Model 6) armed with a turret mounting both a 105mm howitzer and a 7.62mm machine gun was also used in South Vietnam by the Marine Corps for fire support duties.

There was a variety of self-propelled artillery weapons employed during the Vietnam War. Used by both the U.S. Army and Marine Corps was the M109 155mm self-propelled howitzer as pictured. Originally designed as a mobile artillery support weapon able to follow fast moving armored columns into battle, the terrain and missions assigned to the M109 during the Vietnam War found the vehicle normally emplaced in static defensive positions.

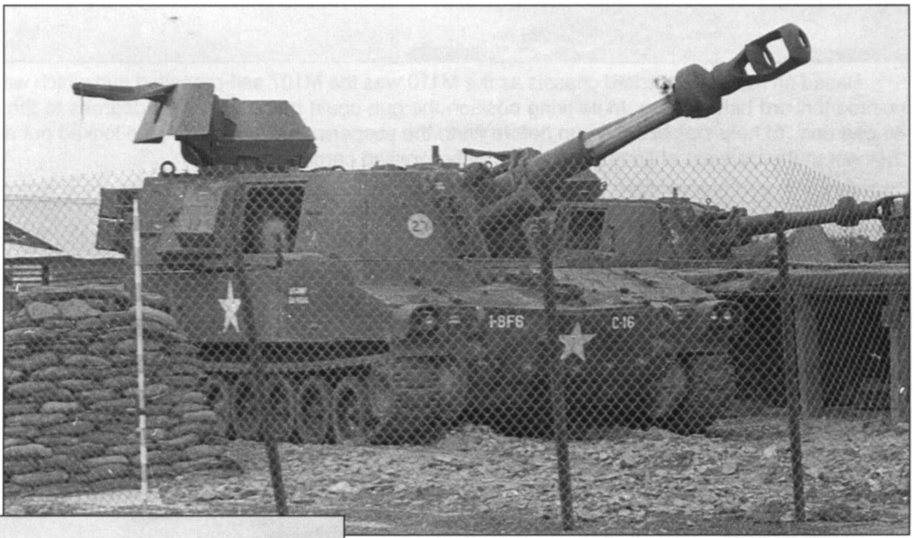




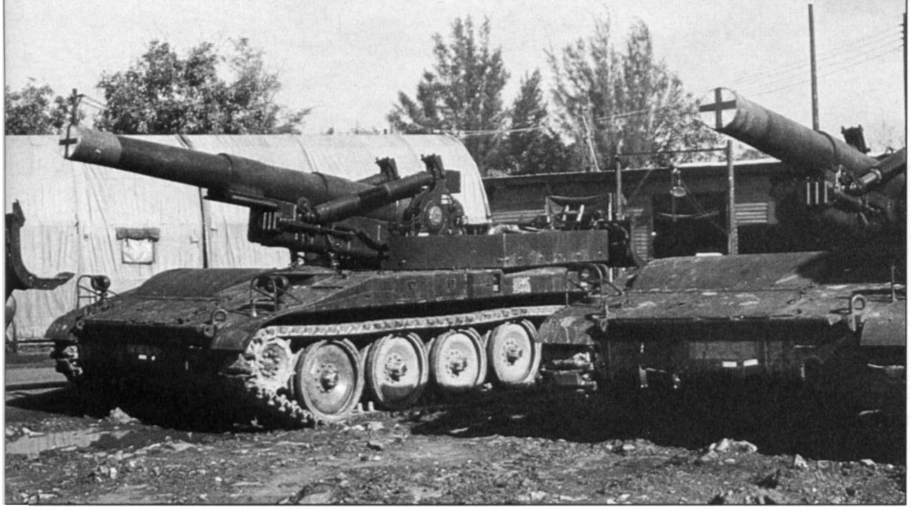
The first M109s were delivered to the U.S. Army in November 1962. The maximum range of the 155mm howitzer on the M109 was about 15,857 yards. The vehicle had onboard stowage for 36 rounds. When firing the main gun the rear spades were normally lowered. The typical rate of fire for the six-man crew of the M109 was one round per minute. Although in a pinch a good crew could fire up to three rounds per minute for a brief period. The crew of this M109 are seen riding on the outside of their vehicle.



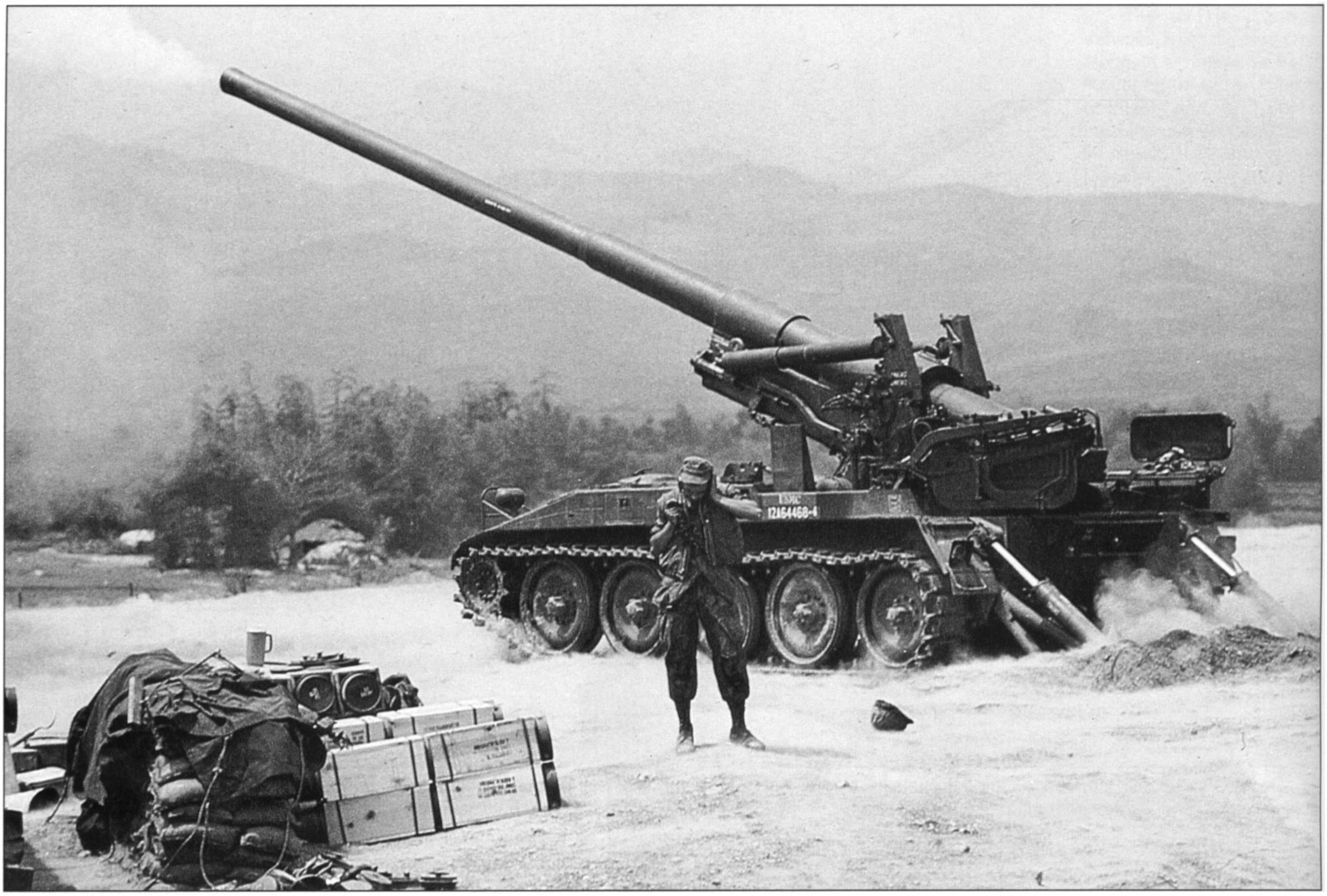
Besides the M109, the Marine Corps in Vietnam also used the M53 and M55 self-propelled field artillery gun. Obsolete by the Vietnam War era, the Marine Corps used whatever they had in Vietnam to provide fire support for their troops. These vehicles would be replaced by M110 self propelled guns in 1967.



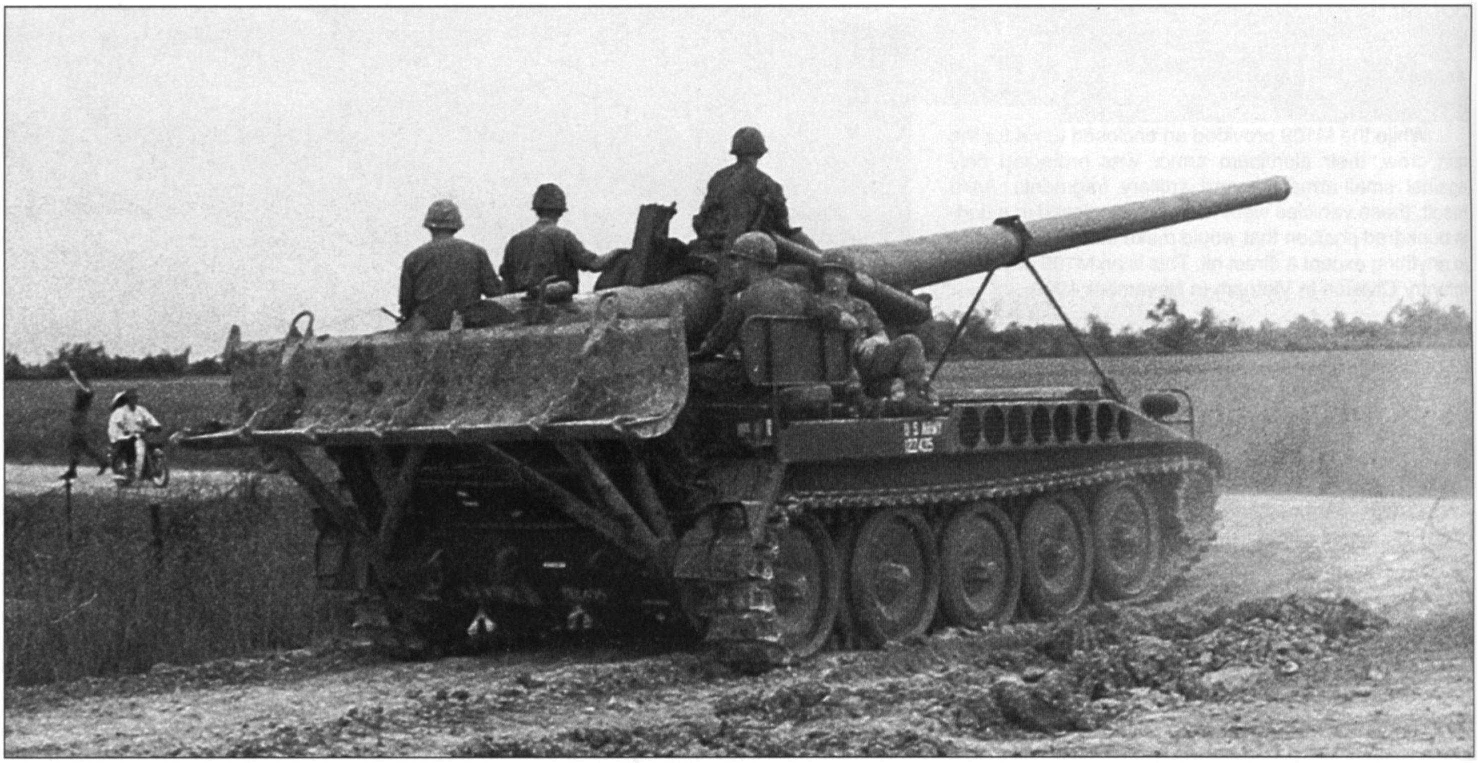
While the M109 provided an enclosed turret for the gun crew, their aluminum armor was protected only against small-arms fire and artillery fragments. As a result, these vehicles were normally emplaced in a dug-in bunkered position that would make them invulnerable to anything except a direct hit. This is an M109 of the 1st Infantry Division in Vietnam in November 1969.



Also used in Vietnam by both the Marine Corps and Army was the M110 8-inch self-propelled heavy howitzer. The tracked chassis which the 8-inch howitzer rode on was constructed of high strength alloy steel and steel armor. The vehicle's gasoline was located in the right front hull. The driver was located in the left front hull. Of the 13 men that serviced the weapon the M110 had room for four on the vehicle. The others rode in an M548 cargo carrier with the main ammunition supply.



Based on the same tracked chassis as the M110 was the M107 self-propelled gun which was armed with a long barrel 175mm gun. The gun was always pointed forward before firing. In its firing position the gun could be traversed 30 degrees to the left or right of center. The elevation range was from zero to 65 degrees. To help stabilize the gun before firing the suspension system could be locked out and the spades at the rear of the vehicle lowered. Pictured in Vietnam at the moment of firing is an M107 self-propelled carrier and gun.



Not designed to have any armor protection (except for the driver), the M107 175mm self-propelled field artillery gun saw heavy use in Vietnam. Normally used in dug-in static positions for fire support, the M107 had a long history of technical problems which lessened its effectiveness during the war years. The M107 pictured in South Vietnam is in transit. Visible is the vehicle's rear spade as well as the travel lock designed to keep the long gun tube steady when in motion.

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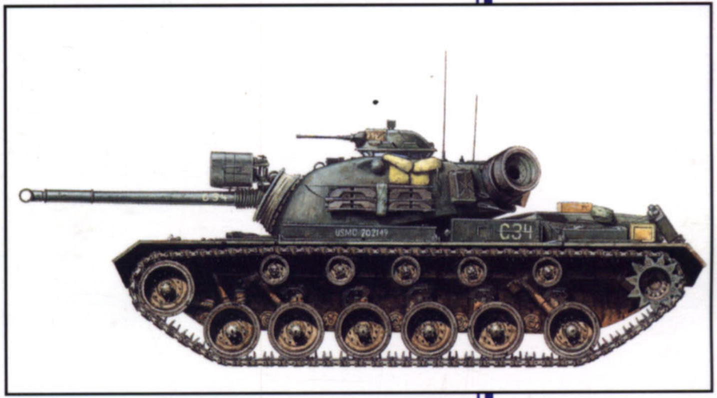
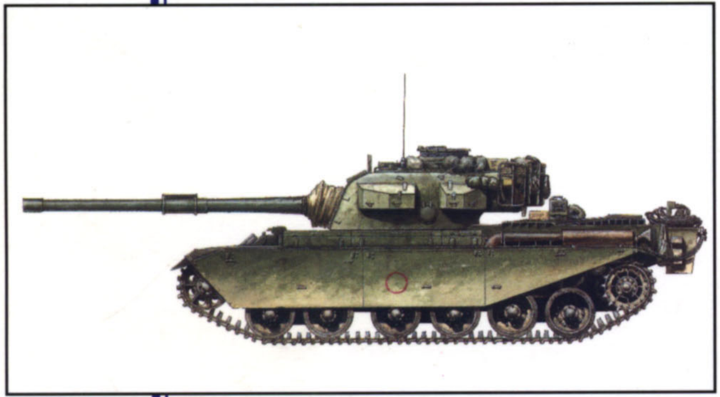
ARMOR OF THE VIETNAM WAR

(1) ALLIED FORCES





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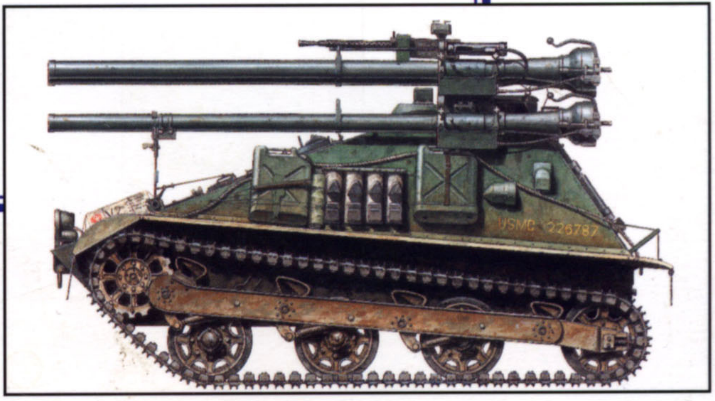

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